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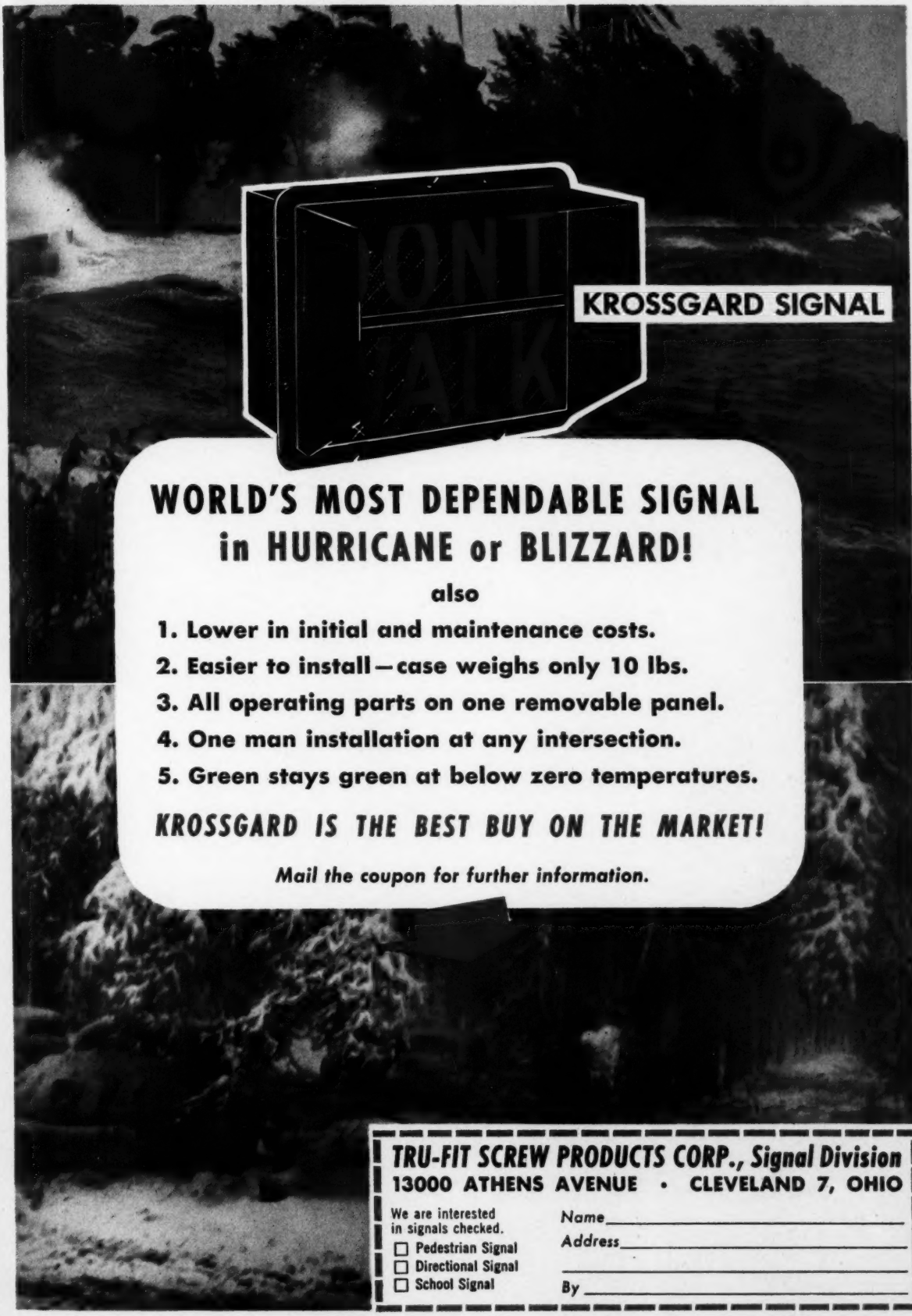

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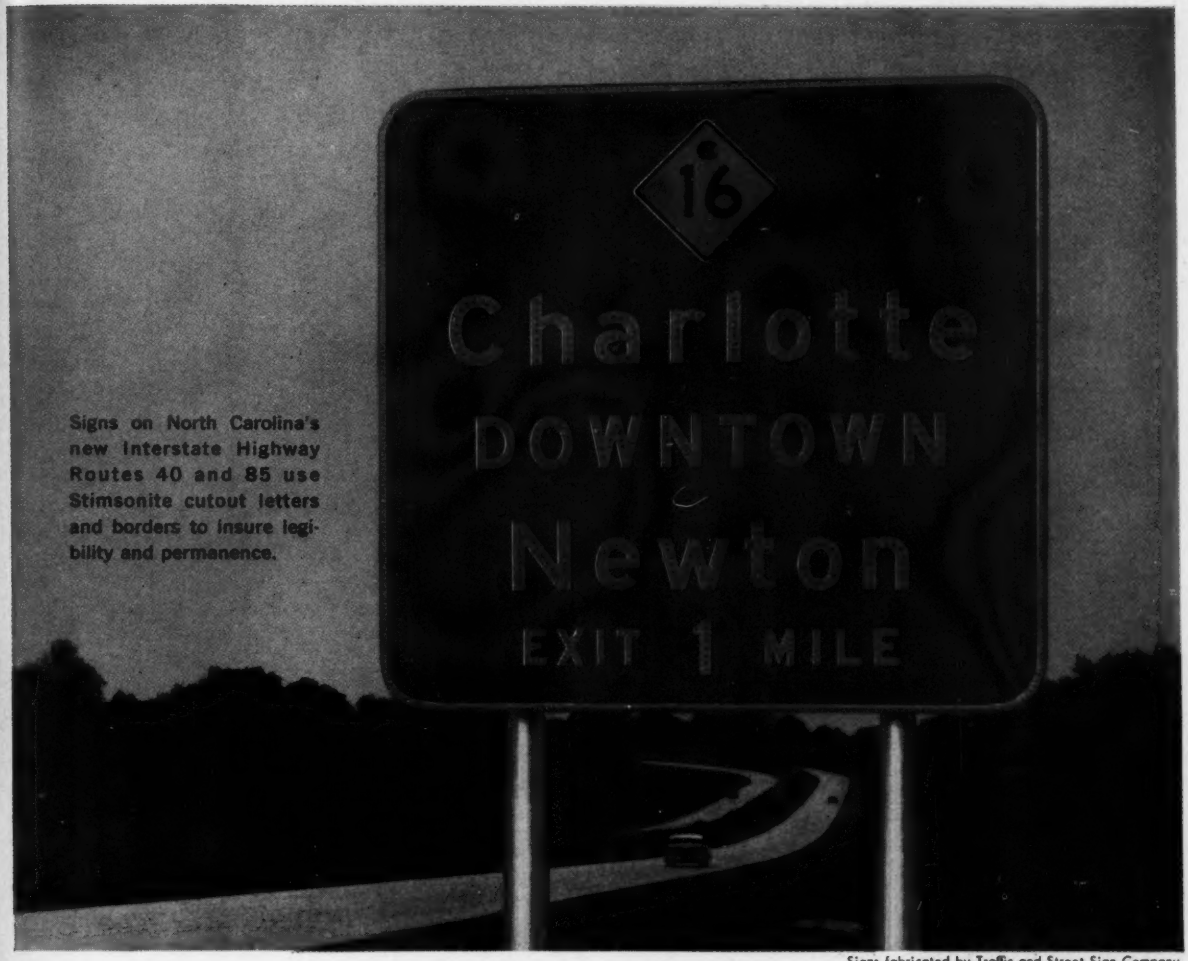

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TRAFFIC ENGINEERING

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

Vol. 29 NOVEMBER, 1958 Number 2

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COVER: The original Miami Beach business district and its MacArthur Causeway link (under construction) to Miami in the Background. —Photo by Miami Beach News Bureau

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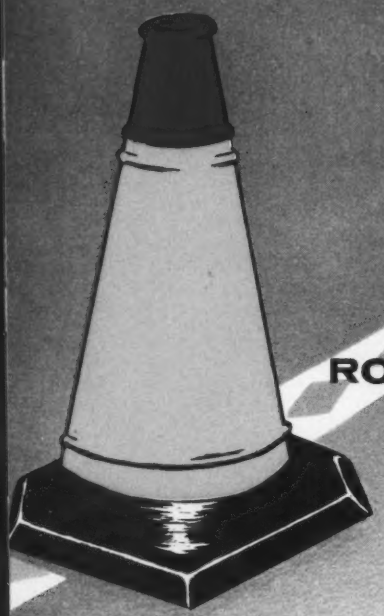

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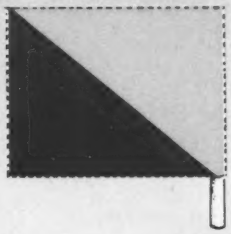

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Frankly Speaking . . .

WHERE HAVE WE BEEN? WHERE ARE WE? WHERE ARE WE GOING? In one way or another, by acts of omission or commission, the activities of an annual convention determine the answers to these questions. Never was such self-appraisal more timely in the still young life of the Institute of Traffic Engineers.

A wise sign foreman once remarked that there are three basic types of drivers: those who know where they are going and how to get there; those who know where they are going but don't know how to get there; and, those who don't know where they are going and don't know how to get there. Certainly, in every endeavor each of us likes to think of himself in the first classification rather than the third, for as the foreman said, there is little that can be done for the completely "lost."

The renewal of old acquaintances and friendships reminds us of where we have been. The social activities strengthen these bonds and develop understanding that changes the membership from a list of names in a yearbook to a meaningful group of professional men with common objectives.

The Technical Sessions bring us up-to-date on current progress and tell us where we are, professionally speaking.

The Resolutions of the Convention should point the way into the future and tell us where we are going as a profession.

Never before in the history of automotive transportation has there been a more critical stage or significant "turning point." We have experienced a "breakthrough" in the planning and financing of a National System of Interstate and Defense Highways. Brief experience, thus far, indicates that the program is sound and can succeed in its objectives. But already the forces of reaction to the dynamics of the undertaking appear as obstacles or new problem areas to be studied and solved. The impact of freeway planning, construction, and operations upon the community is being experienced and each of us engaged in the traffic engineering profession is being required to look beyond our drafting boards, our computers, and our conference tables to examine the cause and effect of our work.

The ability, limitations, desires, and requirements of motorists in relation to an extensive mileage of toll-free controlled access highways represents an area of limited knowledge and experience.

The complexities of our metropolitan areas and the problems of growing congestion post a threat to the orderly expansion of our economy.

Anticipated increases in population and motor vehicle registration without indication of an early reversal in the trend toward an increasing total annual traffic casualty toll make it incumbent upon all professions related to automotive transportation to underscore and coordinate their efforts toward a more safe and efficient system.

The technical program of the Institute's 1958 Annual Meeting gives recognition to and opportunity for the study and discussion of current problems and possible solutions for future applications.

We welcome those members and guests who are able to convene with us and we trust that the time spent will be both pleasant and productive. We urge serious deliberation of the problems at hand so that the proceedings of the meeting will record a constructive contribution to the broad objectives of our profession.

J. E. HAVENNER
President,
Institute of Traffic Engineers

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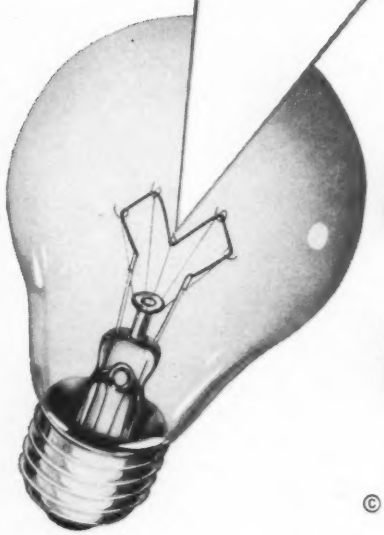

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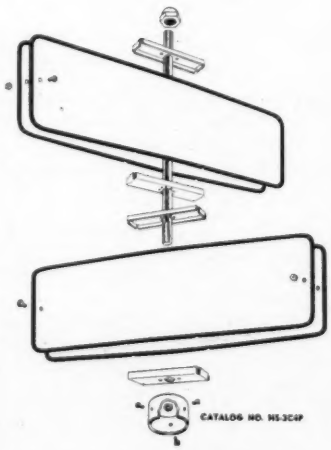

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Welcome to Miami Beach!

WELCOME TO MIAMI BEACH and the 28th Annual Meeting of the Institute of Traffic Engineers. The twin cities of Miami and Miami Beach are happy to be hosts to those attending this meeting.

The estimated attendance of over 1,000 members, non-members, wives and families heralds the possibility of achieving the largest annual meeting yet held and the twin convention cities have geared their "fun-in-the-sun" machinery accordingly.

Although many members plan to arrive a few days early for pre-convention committee meetings, the convention will be formally opened with a luncheon Tuesday noon at the Deauville Hotel, headquarters for the meet.

The first technical sessions will follow the opening luncheon and will be highlighted by the key-note address of W. F. Babcock, North Carolina Director of Highways, and presentation of the two papers winning the coveted Theodore M. Matson Award and Past President's Award of the Institute.

More technical sessions are on tap for Wednesday morning while the post-luncheon hours will be devoted to the Institute's annual business meeting. This latter session is the only event of the convention restricted in attendance to Institute members.

The final day of the convention, Thursday, will feature a host of informational sessions. The morning hours will be highlighted by meetings of the Institute's six technical departments followed in the afternoon by other professional papers and discussions.

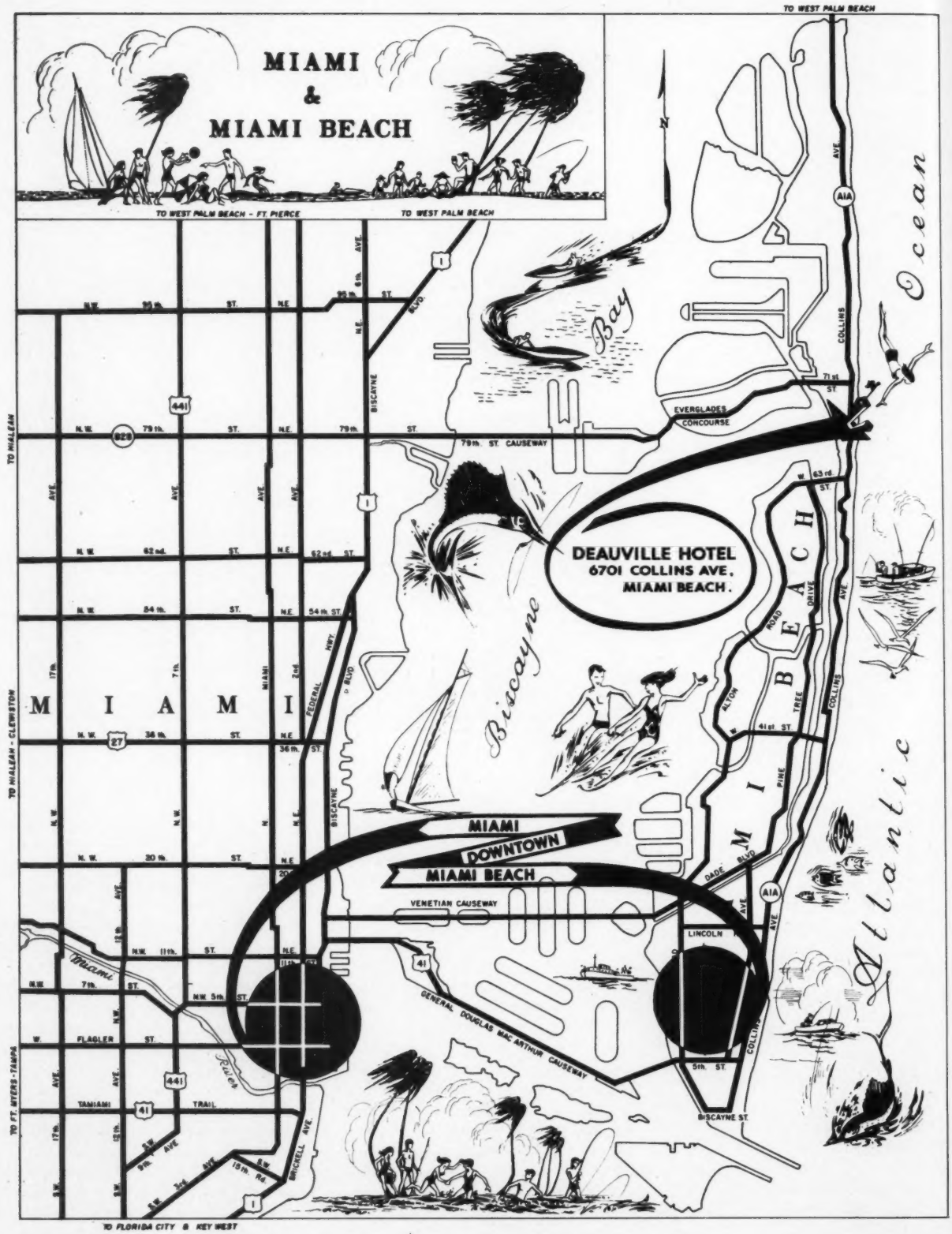
Convention wind-up activities at the Deauville Hotel will include an afternoon party for members followed by the closing banquet Thursday evening.

Actually the activities will begin before the convention with an evening of dancing and a floor show slated for Monday in the Deauville's famous Napoleon Room. More dancing and refreshments will be presented Tuesday in the form of a poolside party at the Deauville with a spectacular water show as an added attraction.

Looking west along palm-lined Lincoln Road with Miami and the Venetian Causeway in the background. —Photo by Miami Beach News Bureau

Convention planners have gone all-out in providing activities of interest for wives and families. Paramount among these attractions is the luncheon Wednesday at Miami Beach's famed Dupont-Tarleton Hotel followed by a guided tour of any of three of Greater Miami's scenic wonders. Entertaining performances by parrots, cockatoos and macaws, counter-pointed by stately peacocks and flamingos set in vivid tropical landscaping, await those electing the Parrot Jungle trip. Visitors to the 55-acre Seaquarium on Rickenbacker Causeway will see the many wonders of the tropical seas plus continuous entertainment by leaping porpoises, performing sea-lions and divers feeding man-eating sharks. Visitors will also be given a behind-the-scenes look at new catches as the collecting boats arrive. Color film and cameras are a "must" for these trips. Those having a more æsthetic taste will find the tour of the Dade County Art Museum, better known as Villa Viscaya, a pleasing interlude. Vicaya, formerly the estate of the late James Deering, is a fabulous reproduction of an 18th century Italian palace complete with formal gardens and furnishings of that period. Shutter-bugs will have a wealth of subjects here, too.

No buccaneer raiding the Spanish Main ever had a better choice of "treasure trips" than those available to convention delegates in the Greater Miami area and the state. During the nearly 40 years since Henry M. Flagler opened this sub-tropical playland to the world with the Florida East Coast Railroad, Dade County and its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environs has grown in recognition as the "American Riviera."

The city of Miami Beach, born in 1915, has been dedicated solely to the vacation needs and pleasures of the world. It is for this reason that wives with an eye for fashions will find shops representing New York and Paris on fabulous Lincoln Road. It is also the reason that the numerous and resplendent nightclubs in the area present top-flight entertainment from the world-over.

Many convention delegates and their families will be content to spend their spare time loafing in the sun and swimming. This idea goes hand-in hand with the many miles of superb beaches and sea-side parks in the area which have always been the "Gold Coast" major drawing card. Crandon Park, located on Virginia Key, with its two miles of unbroken beach and 10,000 bearing coconut trees plus planned parking for 6,500 automobiles offers a truly unique escape from the bustle of the everyday world.

The convention-goer who likes to roam and sight-see on his own initiative will find a number of worthwhile attractions to fill the leisure hours. Notable among these are: The Aquafair, featuring five unique water shows daily; Musa Isle Seminole Indian Village, offering a glimpse into the life of the "original Floridians"; the Ancient Spanish Monastery, built in Spain 350 years before Columbus discovered America; and the Miami Beach Art Center. Those delighting in a first-hand view of the wonders of the deep will find excursions on glass bottom boats, complete with deep sea diver, at the Miami Beach Chamber of Commerce docks. Sight seeing trips of the waterways or attractive homes are also available daily.

The Deauville Hotel (center) Convention Headquarters (looking east, seaward).
—Photo by Miami Beach News Bureau

These diversions are only a few of the many splendid activities available during your stay. Sports fans lingering thru the weekend will have an opportunity to see the vaunted University of Miami Hurricanes in action when they meet the tough University of Maryland Terrapins Friday night in the fabulous Orange Bowl stadium. Deep sea fishing enthusiasts will find superior facilities for their sport practically at their back door. Charter boats may be found at the Miami and Miami Beach municipal docks, Haulover Beach Marina, Crandon Park Marina and many other smaller facilities. Tackle shops abound throughout the area.

Other interesting pastimes, including legitimate theatre productions, civic events and palatial movie theatres are standard fare during this part of the season.

Some members having their own automobile or including this convention in their annual vacation will have the opportunity of visiting attractions and engineering points-of-interest throughout the state. Outstanding among these are the huge Sunshine Skyway, bridging the mouth of Hillsborough Bay at St. Petersburg, Florida's fabulous Silver Springs at Ocala, the newly-completed Woodruff Dam project at Chattahoochee and the historically important city of St. Augustine, oldest town in America.

Whatever desires dictate your pleasure the host-members join the cities of Miami and Miami Beach in welcoming you to "the land of sunshine" and hope they have helped make this convention a pleasurable success for each of you.

New Miami Beach terminus of the MacArthur Causeway showing elevated left-turn lane.
—Photo by Wade Blake, Florida State Road Dept.

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28th Annual Meeting

INSTITUTE OF TRAFFIC ENGINEERS

Miami Beach, Florida

November 10-13, 1958

TECHNICAL PROGRAM

Monday, November 10

Technical Committee Meetings
(at the call of the chairman)

Tuesday, November 11

TECHNICAL SESSION No. 1 — 2:00 TO 4:30 P.M.

Presiding—Joseph E. Havenner, *President, Institute of Traffic Engineers*

Keynote Address—W. F. Babcock, *Director, North Carolina State Highway Commission, Raleigh*

Presentation—Theodore M. Matson Memorial Award —*Presented by* Burton W. Marsh, *Chairman, Board of Awards, Matson Memorial Award Fund*

Paper—*by the winner of the Award*

Presentation—ITE Past Presidents' Award —*Presented by* J. Carl McMonagle, *Chairman, Past Presidents' Award Committee, Institute of Traffic Engineers*

Paper—*by the winner of the Award*

Wednesday, November 12

TECHNICAL SESSION No. 2 — 9:00 TO 11:45 A.M.

Presiding—Robert A. Burch, *Director, District 5 ITE*

"Metropolitan Traffic Planning"—K. S. Vaughan-Birch, *Director, Traffic Division, City Engineering Department, Vancouver, B. C.*

"Traffic Organization in Metropolitan Areas"—O. W. Campbell, *Manager, Dade County, Florida*
and
Samuel Cass, *Traffic Engineer, Municipality of Metropolitan Toronto, Ontario*

"Land Use Planning Related to Traffic Generation and Estimation"—Arthur T. Row, *Executive Director City Planning Commission, Philadelphia, Pa.*
and
William R. McGrath, *Director, Department of Traffic and Parking, New Haven, Connecticut*

"Traffic Operations on Freeways"—C. C. Robinson, *Secretary, ITE Freeway Operations Seminar Steering Committee, and Traffic Engineer, Automotive Safety Foundation, Washington, D. C.*

ANNUAL BUSINESS MEETING — 2:00 TO 4:00 P.M.

Presiding—Joseph E. Havenner, *President, ITE*
(Open only to Institute members—all grades)

Reports of Officers

Election of Officers and Directors

Other Institute Business

Thursday, November 13

TECHNICAL SESSION No. 3 — 9:00 TO 9:30 A.M.

Presiding—Edward G. Wetzel, *Vice President, ITE*

Summary of Technical Council Activities—Robert J. Allen, *Secretary, Technical Council, ITE and Asst. Manager, Accident Prevention Dept., Association of Casualty & Surety Cos., New York City*

CONCURRENT SESSIONS OF TECHNICAL DEPARTMENTS— 9:30 TO 11:45 A.M.

Department No. 2 — C. C. Robinson, *Department Head.*

Improving the Traffic Engineering Inventory — John H. Bunch, *Traffic Engineer, Madison, Wisc.*

Traffic Engineering Re-defined — Norman Kennedy, *Asst. Director, Institute of Transportation and Traffic Engineering, University of California, Berkeley, Calif.*

Developing Efficient Traffic Engineering Record Systems—John E. Baerwald, *Assoc. Professor of Traffic Engineering, University of Illinois, Urbana, Ill.*

Department No. 3—J. E. P. Darrell, *Department Head.*

Warrants for Off-Center Lane Movements — R. G. Fencl, *Traffic Engineer, Chicago Park District*

Warrants for Transit Lanes—E. E. Olmstead, *Traffic Engineer, Chicago Transit Authority*

Standards and Warrants for School Crossing Protection—Robert D. Dier, *Traffic Engineer, Long Beach, California*

Warrants for One-Way Streets — Eugene V. Avery, *Traffic Engineer, St. Paul, Minnesota*

Department No. 4—S. S. Taylor, *Department Head.*

Roadway Safety Lighting—C. H. Rex, *General Electric Company, Hendersonville, N. C.*

Pedestrian Signal Warrants—A. Wallace Gove, *Traffic Engineer, Worcester, Massachusetts.*

Yield Right-of-Way Sign Warrants—Herbert B. Woodling, *Traffic Engineer, Akron, Ohio*

Four-Way Stop Signs — Samuel Cass, *Traffic Engineer, Municipality of Metropolitan Toronto, Ontario.*

"What's New in Traffic Control Devices?"—Panel led by Henry A. Barnes, *Commissioner of Transit and Traffic, Baltimore, Maryland and* S. S. Taylor, *General Manager, Dept. of Traffic, Los Angeles, California.*

Department No. 5—J. A. Head, *Department Head.*

Uphill Traffic Lanes—A. R. Pepper, *Traffic Engineer, Colorado Department of Highways, Denver, Colorado*

Driveways and Curb Cut Permits and Design—Harold G. Bauerle, *Traffic Engineer, Michigan State Highway Department, Lansing*

Channelization Design — Progress Report of the Committee.

Operational Planning Criteria for Urban Trafficways —D. W. Schoppert, *Automotive Safety Foundation, Washington, D. C.*

Design Criteria on Urban Expressways—J. J. Dobolek, *Traffic Engineer, Design, Detroit Dept. of Streets and Traffic, Detroit, Michigan*

Department No. 6—E. R. Ricker, *Department Head.*

Parking Garages—Eugene A. Barton, *H. K. Ferguson Co., Cleveland Ohio.*

Bus Terminals—Virden A. Rittgers, *Rockland Coaches, Bergenfield, N. J.*

Airport Parking—Robert W. Harris, *Traffic Engineer, Bureau of Street Traffic and Parking, Chicago*

Department No. 7—Wayne N. Volk, *Department Head.*

Proposed Standards for Pedestrian Signals and 12-inch Signal Heads—Marble J. Hensley, *Traffic Engineer, Chattanooga, Tennessee*

Demonstration and Discussion of Traffic Signal Lens Color Standards—Charles S. Michalski, *Traffic Engineer, Citizens' Traffic Safety Board, Chicago, Illinois.*

Proposed Standard Specifications for Illuminated Signs—R. I. Strickland, *Asst. Chief, Traffic Engineering Div., Port of New York Authority*

A Model Performance Specification for Pavement Marking Paint—D. J. Branigan, *District Traffic Engineer, Illinois Division of Highways, Dixon*

Types of Survey Equipment and Methods of Use—E. Wilson Campbell, *Chief Traffic Engineer, Chicago Area Transportation Study*

The Mackinac Bridge Signal System — Edward F. Gervais, *Traffic Research Engineer, Michigan State Highway Department, Lansing*

Problems in Designing Sign Structures for the Illinois Toll Highway—William F. Bauch, *Engineer of Design, Illinois Toll Highway Commission, Chicago*

Progress in the Use of Colored Reflectorized Signs—A. R. Pepper, *Traffic Engineer, Colorado Department of Highways, Denver*

TECHNICAL SESSION No. 4 — 2:00 TO 4:30 P.M.

Presiding—Herbert C. Higgins, *Director, District 6, ITE (1955-58)*

"Electronics and Traffic Control"—A Panel Discussion

Joseph B. Bidwell, *General Motors Research Staff, Detroit, Michigan*

Dr. L. E. Flory, *RCA Laboratories, Princeton, N. J.*

Alger F. Malo, *Director, Department of Streets & Traffic, Detroit, Michigan*

O. K. Normann, *Deputy Assistant Commissioner for Research, U. S. Bureau of Public Roads, Washington, D. C.*

T. T. Wiley, *Commissioner of Traffic, New York, New York*—Moderator

"Applications of Computers to Traffic Problems"—D. L. Gerlough, *Associate Engineer, Institute of Transportation and Traffic Engineering, University of California, Los Angeles, California*

"How Far Should We Go In Striving for Uniformity?"—A Discussion

George W. Howie, *Director of Public Utilities and Traffic, Cincinnati, Ohio*

and

Edmund R. Ricker, *Traffic Engineer, New Jersey Turnpike Authority, New Brunswick, N. J.*

MOTOR VEHICLE DEATHS AND DEATH RATES

1956, 1957 and 1958

Month	1956	1957	1958	1956-58 Change	1957-58 Change
January	2,954	2,880	2,760	— 7%	— 4%
February	2,652	2,480	2,330	—12%	— 6%
March	2,940	2,890	2,630	—11%	— 9%
April	2,970	2,950	2,600	—12%	—12%
May	3,094	3,000	2,910	— 6%	— 3%
June	3,338	3,310	3,010	—10%	— 9%
July	3,555	3,240	3,140	—12%	— 3%
August	3,535	3,690	3,500	— 1%	— 5%
Eight Months	25,038	24,440	22,880	— 9%	— 6%
September	3,653	3,330			
October	3,476	3,450			
November	3,603	3,570			
December	3,858	3,710			
Total	39,628	38,500			

All 1956 figures are from the National Office of Vital Statistics.
All others are National Safety Council estimates.

Training Opportunities

1959

January 28-30—FREEWAY OPERATIONS SEMINAR—
The fifth in the current series of Freeway Operations Seminars will be held at the Bon Air Hotel, Augusta, Georgia under the sponsorship of the Southern Section of the Institute of Traffic Engineers. Traffic engineers, planners, design engineers, traffic police supervisors and others with responsibility now or in the future for the planning, design or operation of controlled access facilities are invited. For reservation forms and additional information, contact W. S. Derrick, % Georgia State Highway Dept., Atlanta, Ga.

February 2-4 — FREEWAY OPERATIONS SEMINAR—
The sixth in the current series of Freeway Operations Seminars will be held at the Western Hills Inn, Euless, Texas (halfway between Dallas and Fort Worth) under the sponsorship of the Texas Section, ITE. Planners, engineers, and enforcement supervisors who will have responsibility for planning, designing or operating controlled access roadways are invited. For reservation forms and further information, contact T. Robert Buckman, 950 Jennings Street, Fort Worth, Texas.

Traffic Engineering in The Miami Area

CITY OF MIAMI

TRAFFIC ENGINEERING, as a separate municipal function, was first introduced in the City of Miami in 1946, when the Department of Traffic and Transportation was created. Since 1946, the department has experienced several minor changes with regard to its place within the governmental structure of the city, the present designation of the Division of Traffic Engineering being established in September, 1955.

The Division of Traffic Engineering has grown in size from approximately twenty-five employees in 1946 to its present total of fifty-five personnel. The Division is divided into seven separate sections, all under the direction of the Traffic Engineer: Administrative, (5); Maintenance, (26); Parking Meters, (7); Control and Regulation, (6); Signal, (5); Public Transportation, (2); and Traffic Planning, (4). These sections are responsible for the installation and maintenance of all vehicular and pedestrian control and regulation measures and devices, as well as determining the need for them.

Miami's foreward progress in the field of traffic engineering is evidenced by some of the projects now underway. The city's first electronic signal system, employing an automatic cycle computer, will soon be completed on U. S. 1 and Coral Way. Present plans call for future extension cables from its intersections by gradually replacing all installations with mast arm suspended signal heads.

Public transit is not being negiected by the Division of Traffic Engineering. A project of providing bus pull out bays wherever possible and practical has been underway for some time and is continuing. These bays are being included in most repaving or reconstruction projects throughout the city.

Schools and their immediate areas often create traffic problems. Miami is no exception. To combat many of the

Miami's bus pull-out bays accommodate 40-foot buses with room to spare.

View of elevated left turn lane on Miami Beach's Arthur Godfrey Road.

One of Miami's many modern mid-block aluminum pole and mast arm school pedestrian signals.

Final wiring on a new PR intersection controller in Coral Gables.

city's school crossing problems, some 60 school-pedestrian signals were installed prior to the beginning of the 1958-59 school term. These installations are at mid-block locations and consist of two, one-way, three section signal heads facing vehicular traffic. Pedestrians are controlled by standard WALK - DON'T WALK signals. The pedestrian signals are actuated by push-button, and are in operation at all times.

Publicity, instruction of school children, and rigid enforcement are a part of the school signal program. It is anticipated that the city will be able to eliminate all 15 m.p.h. school zones and many of the crossing guards.

The Department is also doing a traffic survey for Dade County attempting to accomplish the following objectives:

1. Recommending a county-wide arterial street system and extensions to the existing freeway plan.
2. Determine the feasibility of a unified county-wide transportation system.
3. Recommend definite policies and procedures to be followed throughout the county on the institution and installation of all traffic control devices and measures.

And as is usual with most traffic engineering departments much progress has been made during the past years on public relations, acceptance and cooperation. Close liaison with other city departments and municipalities, especially the police has been attained.

A typical year's work of the department is as follows:

Painting of:
- 5,000 crosswalks
- 475 miles of lane line
- 150 pavement messages

Installation, repairs, or replacement of:
- 9,000 signs and posts
- 10,000 feet channelization curbing
- 9,900 parking meters
- 12,000 parking meter posts
- 100 new or reconditioned installations
- 680 traffic signals

Studies consisting of:
- 500 parking locations
- 150 volume counts
- 600 transportation studies
- 10,800 emergency calls and routine investigations.

MIAMI BEACH

Traffic Engineering in Miami Beach has been accelerated in the past several years. Conventioners will be able to view many of the accomplishments.

Most interesting is probably the MacArthur Causeway 6-lane fixed span bridge with an elevated left turn lane. This is one of the few such installations in this country. Also a 1000-car multiple level parking area in Lincoln Lane is virtually completed. An Interstate span causeway and bridges connecting Miami Beach and Miami in the vicinity of 36th Street is well underway also.

Traffic engineering is under the control of Jesse Marsh and at the present time 14 men are employed in administration, surveys, signal and signs, maintenance, and accident record analysis.

Despite its relatively small size Miami Beach has 13,500 offstreet parking spaces, 132 miles of streets, 1070 intersections (155 signalized), 3770 traffic signs and 72 miles of modern whiteway street lighting.

The city has had a comprehensive O-D survey and a traffic engineering study made.

The traffic division reviews permits for parking lots, garages, detours, special events, curb cuts, and hauling and moving. It also studies proposals for: intersection design, street lighting, taxi and loading zones, truck routing, street widening, resurfacing, retreading, municipal offstreet parking, bus routing, sidewalks and bridge construction and, of course, traffic signals.

City forces spent 3300 man days on control device maintenance last year and installed or replaced 400 signs. Since 1948 composite traffic counts have been taken at 28 major intersections quarterly.

Miami Beach also has a unique zoning regulation requiring future hotels and apartments to provide 1 1/2 offstreet parking stalls for every 2 units.

CORAL GABLES

In April of 1956 the City Commission of Coral Gables established the Traffic Engineering Department and William B. Wellons, Assistant Director of Public Works, was named Traffic Engineer. In organizing the depart-

(Continued on page 21)

Traffic Operations On Freeways

By Paul F. Royster
Assistant to Federal Highway Administrator
Bureau of Public Roads, U.S. Department of Commerce

The Keynote Address before the Freeway Operations Seminar, Harrisburg, Pennsylvania, October 6, 1958.

TRAFFIC OPERATIONS on freeways involve a group of people who represent a variety of interests. City and state police officials, traffic engineers, planners, highway design engineers, and transportation specialists are but a few of the diversified occupations involved in this cooperative effort to gain a better understanding of the problems involved in traffic operations on freeways. Efforts of this type are typical of the cooperation between legislative, highway user, and technical groups that has been necessary to get the present program of highway construction and improvement under way. It is evident that this cooperative spirit must continue if the Nation is to realize the full potential of the benfits from this most extensive construction program ever undertaken.

The National System of Interstate and Defense Highways will be, in a few short years, a 41,000-mile network of freeways, freeways wtih planned access control to insure the best possible safety of operation, freeways able to maintain the type of service and the capacity for which the system is being designed. Traffic operations on this system will be quite different than on most of the highway mileage previously built. Even when compared with the toll roads that are now in operation, there will be a striking difference in many respects. The Federal Highway Act, for example, prohibits the development of automotive service facilities and commercial establishments, including restaurants, on the rights-of-way of Interstate highways. The Congress was fully aware of the difficult administrative problems that would develop if private businesses were permitted on the rights-of-way of Interstate highways. The Congress, fortunately, realized the need for preserving the high type of traffic service and capacity for which the system is being built.

New rights of way in rural areas will run through undeveloped areas in many cases.
—Ohio Dept. of Highways Photo

Services for the motorist and his vehicle, such as restaurants and gasoline service stations, must be provided on the crossroads near the interchanges. But remember, these locations will be from three to five times more frequent and accessible to the freeway traffic on the toll-free facilities than on the toll roads. To assure that the motorist can obtain the needed services conveniently, the State highway departments must and do consider this feature in their design of the ramp termini at the crossroads. The local authorities, such as planning agencies, and zoning agencies, can do much to control the development on these crossroads so that an orderly plan emerges. The end result can and should be beneficial to the community as well as convenient to the motorists who desire these services. Adequate signs on the Interstate highways to direct motorists to these services, and a cooperative spirit between commercial groups who provide the services will help to promote the nationwide acceptance of the planned access principle.

Just how far it will be necessary to go in providing emergency services to motorists in distress on the Interstate highway itself has not been determined. This is one of the many new and challenging problems that confront highway officials as they build long mileages of high-speed, controlled-access highways. A stranded motorist on any highway is in an uncomfortable position, but the problem of

obtaining assistance is accentuated considerably on a high traffic volume, controlled-access-highway — one without intersections at grade, service areas, and roadside business places. For safety reasons, and other reasons as well, the toll roads have found it desirable to provide a high type of emergency service to motorists in distress. On these roads, information received by the Bureau of Public Roads indicates that there is one automotive breakdown requiring assistance for each twenty to thirty thousand vehicle miles of travel. "Out of gas" and "tire trouble" each account for about 25 per cent of the total. And this does not include the many breakdowns that did not require assistance.

The frequency of breakdowns on freeways of the Interstate System may be even higher. There will be no toll collection stations where underinflated or badly worn tires can be spotted, and where a vehicle obviously in a poor mechanical or unsafe condition can be denied entrance.

Although no policy has been developed by the American Association of State Highway Officials regarding emergency services to motorists on the Interstate System, the problem has been recognized. Steps are being taken to develop specific policies and procedures for providing motorists' services in the light of prevailing conditions, and the projected needs, in the individual States. In Ohio, for example, the highway department has organized a "Motorist's Service Committee" composed of representatives of various civic, governmental, and roadside business associations having Statewide interest. A full-time State staff official has been appointed to work with these groups to develop Statewide policies, guides and standards in order to assure satisfactory services to Interstate travelers. Current discussions should help to clarify this problem, as they help to promote the cooperative spirit so essential to its solution.

More definite action has been taken by the American Association of State Highway Officials with respect to other problems concerning the Interstate highways. The Association has adopted a policy for signing the Interstate System with the full support of the Bureau. A policy guide on safety rest areas, and a policy guide on frontage roads, have likewise been enunciated, with Bureau backing. Committees of the Association have prepared policy guides on the fencing of controlled access highways, and on locating police stations and maintenance yards serving the Interstate highways. These two policies have been endorsed by the Executive Committee of the Association and have been sent to the states for letter ballot.

In urban areas, the new facilities will cut boldly through built-up areas, with many major structures, as on the Jacksonville (Fla.) Expressway.

It is clearly the intent of the Asociation's policy on signing to restrict signs on the Interstate highway to those necessary for the safe and expeditious operation of traffic. Signs will be justified only for important messages such as warnings and direction signs to interchanges and other justifiable turnouts. Messages will have to be simple and the letters used must be large. There will be many requests received from local and quasi-public agencies, all doing excellent and commendable work, for sign installations. The highway departments must necessarily refuse almost all of these, if they hope to preserve the traffic service of the highways.

The Association policy on safety rest areas is deliberately limited in scope. It calls for rest areas, as a safety measure, separated from the through-traffic roadways, and with high-type entrances and exits includ-

New standards of service will be expected from these new roads—notice the lighting and the signs on Edens Highway (Cook Co., Ill.).

When finished, these controlled access roads will move traffic safely and quickly.
—Ohio Turnpike Photo

ing acceleration and deceleration lanes. They may be designed for short-time picnic use, with water supply and toilet facilities where proper supervision and maintenance are assured. They are not going to be designed for use as local parks, active recreation, or overnight camps. Not more than about three acres within the control-of-access lines and in addition to the normal right-of-way requirements may be developed as rest areas. The Bureau has taken the position that tourist information stations may be included within the rest areas, if properly controlled, maintained, and supervised.

The AASHO Committee on Planning and Design Policies is in agreement that direct entrances to the through-traffic lanes from policing and maintenance facilities should be avoided. Greater flexibility and safety can be provided if these facilities are located on the crossroads at interchanges. When located at the crossroads, the facilities will be more accessible to the workers and to other vehicles from all directions, and the need for U-turns and direct crossovers will be eliminated.

Frontage roads are necessarily closely allied with control of access. As a result, frontage roads have been a problem in connection with the design of the Interstate System. Generally, there is no problem where an existing highway is converted to a freeway. In such a case it makes sense to convert the existing highway to one frontage road, and to provide control of access on the other edge by constructing a second frontage road. However, freeways on new location frequently pose the problem. Some states feel that even then parallel frontage roads are essential. As a result there is a considerable variation among the States in their estimates of mileage of frontage road required.

The Bureau of Public Roads with the concurrence of AASHO has taken the position that frontage roads per se are not to be provided where the highway is on a new location. They may be provided, however, in short lengths when necessary to restore local circulation by connecting a local road, that has been cut off, with another road or street crosisng over or under the Interstate highway.

Many of the problems of operating the Interstate System are not new to the state highway departments. Other problems are new, such as the provision of essential services to the motorist. It seems logical then to take advantage of the experience gained thus far on the limited mileage of controlled-access facilities now in operation. Even more important, we must be willing to study traffic operations and review and revise our policies as new mileages of this great system are placed in operation. We must be receptive to new methods and new techniques that are developed to improve the safety and economy of highway transport.

Thus far my discussion has related to the Interstate System. I realize that this seminar is concerned principally with freeway operations, and properly so. However, I must emphasize the importance of coordinating the development of the Interstate System with other streets and highways if the most effective transportation system is to be provided. It has been estimated that on the rural section of the Interstate System there will be some 12,000 interchanges. This is an average spacing of one every 3.7 miles with additional highway grade separations spaced an average of 3.9 miles apart.

On the urban sections, the spacing of interchanges and grade separations obviously will be much closer. Properly located, they will encourage good urban development and will be of great value to a community. Improperly located they can impair or even prevent desirable growth and community life. It is for this reason that the cooperation of city officials is so important in locating urban freeways and their connections to the existing street systems. The traffic engineer in a city can help to determine the most desirable locations for the interchanges so that the freeways and city streets will function as coordinated systems. The traffic engineer also can help to prevent delays in getting the freeway construction program under way in his city by making certain that the city officials understand the extent to which a freeway will affect the urban areas, especially with respect to traffic volumes on the connecting streets. State highway departments are often criticized, sometimes even castigated, for going ahead with a freeway plan before the city officials are ready and in complete agreement. The criticism in many instances might well have been directed toward the city officials themselves for not being ready. The traffic engineer can help to avoid such situations by getting the various groups together. Traffic operational problems are of common interest to all groups of public officials.

It has been estimated that when the Interstate System is completed, it will carry about 21 per cent of the predicted 1,170 billion vehicle miles of travel for 1975. The other streets and highways will carry the other 79 per cent. And we are talking about 400 billion more vehicle miles than in 1955!

There will be a continuing need for improving city streets and other highways because far more capacity will be required than the Interstate routes alone will provide. Better use of existing facilities along with the full utilization of the new facilities will demand the utmost in traffic engineering skills.

Construction of the Interstate System will be accompanied by changes in travel habits, driver behavior, and traffic patterns. Many of the changes will take place because they are made possible by the construction of the Interstate System. For example, many industries for many years have desired modern plants spread over extensive acreage with adequate parking facilities. They have wanted to get away from multi-story factories in crowded areas. The improved transportation provided by adequate highways has made this desired change possible. Traffic and transportation engineers must keep up with the changing traffic patterns brought about by the rapid industrial and residential development in areas served by freeways.

In some cities there is ample evidence to show that travel between outlying commercial and residential areas is increasing at a much more rapid rate than the travel between these areas and the central business districts. The highway planner and designer need to know these changes in the traffic patterns so that the highways being built will serve, to the greatest extent possible, the transportation needs in both urban and rural areas. It is fortunate that the National Committee on Urban Transportation, composed largely of city officials, has recently completed the preparation of a series of manuals for the collection of highway planning data for cities. These manuals are comparable to those available for rural highways through the Statewide Highway Planning Surveys. The Bureau of Public roads has supported this effort financially. In addition, we have furnished the services of many of the 175 consultants to the staff that prepared these manuals. It is only logical that the traffic engineer with his technical ability should have an important role in coordinating the collection of this information and in its application to the cities' transportation problems.

In conclusion, we must all remember that the public's interest in freeways and other highways is based on the efficiency of the transportation service these facilities provide. Mr. Average Citizen knows little of and cares little for the bundle of design features and operating practices necessary to obtain these final results. May your discussions at these seminars be of real value in helping to clarify or solve the many new problems concerning traffic operations on freeways, and may they help to promote that cooperative spirit between the diversified fields of endeavor so necessary to safe and efficient highway transportation.

TRAFFIC ENGINEERING IN MIAMI

(Continued from page 17)

ment the various traffic functions which were performed by separate departments were brought under the administration of the Traffic Engineer. This included signs and markings, signals, traffic planning and engineering, and the municipal parking system.

The parking system, which actually began in 1951 on a lease basis, has been since supported by a $1,000,000 revenue bond issued to provide municipal off-street parking facilities in the central business district and other critical areas. At the present time the City operates 16 parking lots with a meter capacity of 847 vehicles. The parking meter division maintains and operates a total of 2317 parking meters in this system, both on and offstreet.

In 1957 the City of Coral Gables purchased and installed a traffic adjusted cycle selector traffic signal system for its central business district. This system consisted of a master controller and 22 interconnected signalized intersections. The installation was performed by city forces at a cost of $52,462. This was the first step in the signal modernization program which this department hopes to carry on throughout the city. The department has also adopted minimum standards as set forth in the Manual on Uniform Traffic Control Devices and is continuing a program of replacement of nonconforming devices.

At the present time the department has a staff of 15 people, 5 office and 10 field.

DADE COUNTY

The new Metropolitan Dade County government has just created a Department of Traffic and Transportation to administer traffic engineering on a county-wide basis. This Department, under the direction of George H. Kunde, has as its objectives the development and execution of sound programs for improvement of public transportation service, standardization and modernization of traffic control devices, and planning and development of the arterial street and highway system.

The organization is composed of three divisions: Public Transportation, Operational Traffic and Traffic Planning, which are headed by Dave Reynolds, Don Smith, and Jack Barr, respectively. It will serve to coordinate efforts of Federal, State and local municipal governments, civic groups and private interests toward the betterment of county transportation. In addition to establishing and maintaining standards of traffic control on all streets and arterial highways, this service will include technical assistance to the 26 municipalities and many urbanized, unincorporated areas in alleviating traffic problems and in planning transportation growth.

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How Public Information Can Help the Traffic Engineer

by Earl A. Succo
Director of Public Information
Traffic Engineering Division
Seattle, Washington

NEARLY FOUR YEARS AGO the Traffic Engineer's Division recommended to the city council that downtown Seattle streets be turned into one-way thoroughfares. The opposition which arose threatened to cloud the light of this important solution to a traffic problem. Opposition included merchants and businessmen, civic and fraternal organizations, and even some of the press. The Traffic Engineering Division fought the battle with one of the strongest of all weapons: accurate, factual and timely information.

Age-old principles of human behavior are revealed in the above incident. People resist change, often because it's a concept established by experts. The solution: properly communicate the new concept to the laymen—who, after all, will be most affected — so he understands it.

The battle of the Seattle one-way grid system was short. An abundance of accurate information was channeled to Seattle's press. It was newsworthy because, at the time, anything concerning the one-way grid made news. So it was printed and broadcast to the people of Seattle, for the first time exposing them to the advantages, as well as the disadvantages, of the one-way grid.

We accepted invitations to speak at luncheons and dinners of civic and fraternal organizations, and went seeking more invitations; we offered engineering and enforcement personnel for interviews on radio and television; we told our story to columnists, reporters and editors. In less than six months, the bulk of the opposition had become voices in support of the traffic engineer's proposal of the one-way grid, and the changeover was underway.

We were not pounding desks; we were not selling; we were not promoting. We were simply giving facts—facts both favorable and unfavorable to the one-way grid system. We were condensing the reports and studies on which the traffic engineer had based his decision.

Earl Succo, left, discusses a safety poster with men in the city's sign shop where all the posters are made. Succo is responsible for posters which are used by schools to emphasize traffic safety, and bus posters which might offer tips to citizens or report statistics to make them aware of traffic problems.

A 22-page, simply written, mimeographed booklet, which formed the core of our information, presented the advantages as well as the disadvantages of the system; it objectively and accurately cleared up misconceptions; presented the effect of one-way street grids on business and land values as experienced by other cities of comparable populations; listed the streets which would be made one-way and the direction traffic would be flowing on them; and illustrated some of the advantages of the new concept by simple drawings.

The story of Seattle's one-way grid is merely one example of why keeping the public informed is a valuable philospohy for anyone responsible for traffic control. Seattle's Traffic Engineering Division works on the premise that a continual flow of many types of information serves as an important backdrop for the traffic engineer's activities, and helps create a favorable atmosphere in which the traffic engineer can better plan and operate.

It's a philosophy which can be adopted by those responsible for traffic control in any city of any size. In smaller communities, where neither traffic pro-

grams nor funds warrant a full-time public information director, existing personnel can adopt the philosophy and greatly benefit by it from the standpoint of public cooperation and support for traffic programs.

The most important aspect of any public information program is that it is working—that information is getting to the pubiic.

The position of Public Information Director for the Traffic Engineering Division was created about five years ago in Seattle by Traffic Engineer E. E. Lewarch. Because the position required a communications specialist, rather than an engineer, Mr. Lewarch had priorly assigned me to a position as an engineer aide working in the field with experienced men. I worked on various projects long enough to grasp the principles of the traffic problem, and the solution being utilized. Thus, I was able to grasp enough technology and terminology to understand the engineers I work with daily, and their problems and objectives.

The function of the Public Information Director is simply to provide a continuous flow of information—all of it first approved by Mr. Lewarch, of course—to the citizens.

The work has separated itself into this approximate breakdown of responsibilities:

Mass media (newspapers, radio and television) require about 50 per cent of the Public Information Director's time. This includes preparing news releases on new traffic regulations, detour routings, new installations of signs, signals or channelizations, plans for new construction, street widening, street painting, resurfacing projects, refuse dump operations and all other activities undertaken by the traffic engineering division whether large or small. These news releases are distributed to Seattle's three major newspapers, suburban and neighborhood newspapers, all radio and television stations. We also prepare public service "spot announcements"—the 20 or 30-second between-program announcements used by radio and television stations. These deal with traffic and pedestrian safety and are prepared as "friendly reminders from your city traffic engineer." One radio station has turned over five minutes every other week for a broadcast on traffic matters by the Public Information Director; other radio and television stations occasionally request his appearance for a broadcast to explain some particular phase or project relating to traffic engineering.

About 15 per cent of the director's time is spent in preparation of department publications, such as the annual report of the Traffic Engineering Division. This compilation of statistics of traffic engineering activities goes into the Engineering Department's annual report which is presented to the city fathers and other internal governmental agencies. The director also prepares a monthly publication called "Traffic Tally and Timely Tips" for organizations, schools or the mass media which often use some of the contents for filler items or safety comments. This monthly "Tally and Tip" sheet also includes the police department's summary of accidents for the month. All of these publications are produced inexpensively by mimeograph or ditto machine.

Other reports, such as those for the National Safety Council, the American Automobile Association and requests for information from other cities—require about 10 per cent of the director's time.

Public speaking before community groups, and participation in traffic safety conferences, require about 5 per cent of the allotted time. An example of the opportunities which exist can be seen from a recent four-month period when talks on traffic engineering activities were presented to three high schools, three sessions of the Women's Driver Clinic sponsored by the city-county safety council, the governor's safety conference, and a Seattle service club.

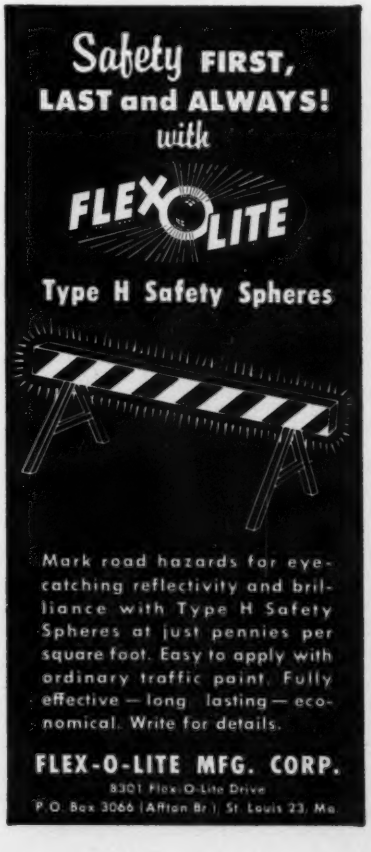
This leaves 20 per cent of the director's time for answering specific questions or providing information to individuals or groups who may request it in person, by mail, or by phone. All routine "complaints" or requests for traffic improvements are investigated by a field engineer. The Public Information Director then notifies the individual by phone, card or letter of his findings, the action taken, if any was required, and the reason action was not taken if it was requested. Through the Public Information Director, the Traffic Engineering Division assists with information, consultation and service, the traffic safety programs undertaken by various groups such as the Vehicle Safety Check Program, Pedestrian Safety Campaigns, Juvenile Traffic Program of the Seattle-King County Safety Council.

The Public Information Director represents the traffic engineer at the meetings of the Chamber of Commerce and other commercial organizations where traffic problems are on the agenda. We originate traffic safety posters each month which are used by schools and merchants, and each quarter prepare cards for display in the city's buses. The posters and bus cards are made at nominal costs in the city traffic sign shop during the slack periods.

All of these functions accomplish these, among other, objectives:

1. Call public attention to the city's major and minor traffic problems, and the solutions by which the traffic engineer is solving them. An important by-product of this objective—which could in fact be a restatement of this objective—is that it gains support for needed traffic engineering activities by providing adequate information about the problems and solutions.

2. It creates a favorable and healthy atmosphere of public cooperation in which the traffic engineer can plan and function.


Safety FIRST,
LAST and ALWAYS!
with
FLEX-O-LITE
Type H Safety Spheres
Mark road hazards for eye-catching reflectivity and brilliance with Type H Safety Spheres at just pennies per square foot. Easy to apply with ordinary traffic paint. Fully effective — long lasting — economical. Write for details.
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Traffic News

30 Engineers to Study Under IRF Auspices

Thirty foreign highway engineers from 22 countries will take graduate engineering courses in American Universities during the 1958-59 school year under the auspices of the International Road Federation. An additional three engineers will study in British colleges.

The IRF program for advanced highway engineering was inaugurated in 1949. Since that time, 174 engineers from 58 countries have participated in this program.

Engineers participating in this program are employed by their respective governments, and will return to their countries in August 1959 following completion of their university work and an observation tour of highway construction.

American Universities where these engineers will study are Northwestern, Ohio State, California, Purdue and Yale. In Great Britain, the IRF-sponsored engineers will study at Durham and Birmingham Universities.

The engineers selected under the IRF Fellowship Program, their home countries and universities are:

Argentina—Jose Eugenio Vicario, California
Bolivia — Gustavo Torrico Rodriguez, Purdue
British Guiana — William A. Phang, Purdue
Canada—Gordon K. Hunter, California
Chile—Luis E. Alvarez H., Northwestern (Assoc. Mem., ITE)
Chile—Enrique Arteaga L., Ohio State
Chile—Juan Walker R., Ohio State
Colombia—Jose Joaquin Acosta, California
Colombia—Roberto Barbosa, Purdue
Colombia—Jose Covo, Purdue
Colombia—Dario Garcia, Purdue
Colombia — Octavio Villegas-Duque, Purdue
Ecuador—Enrique Zavallos, Ohio State
Ghana—Emmanuel Lartey, Northwestern
Guatemala — Mercedes Antillon M., Northwestern
Guatemala—Enrique Yurrita Anzueto, Purdue
Iraq—Kamal Abdul Waly, Purdue
Korea—Lee Duk Hoon, Ohio State
New Zealand—M. R. Palmer, Yale
Nigeria—Solomon B. Audifferen, Purdue
Norway—Per Helge Ulstad, Purdue
Panama—Eduardo B. De Bello, Ohio State
Philippines—Leonardo C. Nuesa, Purdue
Portugal—Manuel Dos Santos Pinto Serrao, Northwestern
Spain — Gonzalo Navacerradaf, Ohio State
Taiwan—Yen Chi-Crang, Northwestern
Taiwan—Hsiao, Tsang-Wen, Purdue
Turkey—Nejat Vural, Northwestern
Vietnam—Le Thanh Trinh, Ohio State
Ghana—A. D. Hammond, Birmingham
New Zealand—A. R. McGibbon—Durham
East Africa—B. A. Sinclair, Durham

One engineer from Brazil is in the process of being selected.

National Engineers Week Set for Feb. 22-28

Fifteen leading engineering figures in a variety of fields have agreed to act as sponsors for the 1959 National Engineers' Week, February 22-28.

The list of sponsors is made up of engineers from industry, education, private practice, government service, and the military.

The fifteen sponsors are: Wernher von Braun, director, Development Operations Division, Army Ballistic Missile Agency; Allen B. DuMont, chairman of the board, Allen B. DuMont Laboratories, Inc.; T. Keith Glennan, president-on-leave, Case Institute of Technology, and administrator, National Aeronautics and Space Administration; Major General Emerson C. Itschner, chief of engineers, United States Army; Charles F. Kettering, General Motors Corporation; James R. Killian, Jr., special assistant to the President of the United States for science and technology; Clarence H. Linder, vice president, General Electric Company; Thomas E. Murray, consultant, Joint Committee on Atomic Energy; Granville M. Read, chief engineer, E. I. du Pont de Nemours and Company; Rear Admiral H. G. Rickover, chief of naval reactors, United States Atomic Energy Commission; Royal W. Sorensen, California Institute of Technology; Philip Sporn, president, American Gas and Electric Company; David B. Steinman, consulting engineer; Bertram D. Tallamy, Federal Highway Administrator; and Charles Allen Thomas, president, Monsanto Chemical Company.

Motor Vehicle Registrations Continue To Climb

Motor-vehicle registrations continue to gain and are expected to reach 68,398,000 for 1958, Federal Highway Administrator B. D. Tallamy announced recently. The rate of increase, however, is expected to continue to decline, following the trend of the past several years. The 1958 estimate, prepared by the Bureau of Public Roads, U. S. Department of Commerce, is based on reports of State registration agencies.

Pasenger cars are expected to total 56,967,000 for 1958, a 1.9 per cent increase over 1957. Trucks and buses are expected to number 11,431,000, a gain of 1.8 per cent.

Recent annual increases in total registrations, which reached a peak in 1955 when the automotive industry attained a record sales volume, have been as follows:

1953—5.7%	1956—4.0%
1954—4.1%	1957—3.0%
1955—7.2%	1958—1.9% est.

California leads the States in expected total 1958 registrations with 7 million, followed by New York with nearly 5 million. Texas and Pennsylvania will each have over 4 million; Ohio, Illinois, and Michigan, over 3 million; New Jersey and Florida, over 2 million. These nine States account for 51 per cent of the total registrations. In addition to these States, 18 others are expected to have over 1 million registrations each.

Arizona leads in anticipated increase in total registrations with 6.9 per cent, followed closely by Florida with 6.8 and New Mexico with 6.4 per cent. Eighteen States have expected gains of 2 per cent or more. Seven States will have gains of less than 1 per cent, the lowest being West Virginia with 0.4 and Michigan with 0.1. The only actual decline anticipated is in the District of Columbia, a loss of 0.9 per cent.

U. S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

PRELIMINARY ESTIMATE OF 1958 MOTOR-VEHICLE REGISTRATIONS 1/

September 1958

STATE	AUTOMOBILES			TRUCKS AND BUSES			TOTAL MOTOR VEHICLES		
	REGISTERED 1957	ESTIMATED 1958	PERCENT CHANGE 1958/1957	REGISTERED 1957	ESTIMATED 1958	PERCENT CHANGE 1958/1957	REGISTERED 1957	ESTIMATED 1958	PERCENT CHANGE 1958/1957
Alabama	908,629	926,000	1.9	214,392	217,000	1.2	1,123,021	1,143,000	1.8
Arizona	383,017	410,000	7.0	106,411	113,000	6.2	489,428	523,000	6.9
Arkansas	436,453	445,000	2.0	190,550	192,000	0.8	627,003	637,000	1.6
California	5,808,837	6,001,000	3.3	1,023,113	1,068,000	4.4	6,831,950	7,069,000	3.5
Colorado	631,571	657,000	4.0	183,979	192,000	4.4	815,550	849,000	4.1
Connecticut	882,839	892,000	1.0	124,814	129,000	3.4	1,007,653	1,021,000	1.3
Delaware	131,085	137,000	4.5	39,755	43,000	8.2	170,840	180,000	5.4
Florida	1,689,375	1,813,000	7.3	281,328	291,000	3.4	1,970,703	2,104,000	6.8
Georgia	1,056,708	1,072,000	1.4	263,580	268,000	1.7	1,320,288	1,340,000	1.5
Idaho	239,331	243,000	1.5	102,671	107,000	4.2	342,002	350,000	2.3
Illinois	3,075,578	3,111,000	1.2	437,604	444,000	1.5	3,513,182	3,555,000	1.2
Indiana	1,567,848	1,583,000	1.0	339,569	338,000	-0.5	1,907,417	1,921,000	0.7
Iowa	989,790	1,000,000	1.0	231,422	236,000	2.0	1,221,212	1,236,000	1.2
Kansas	830,861	842,000	1.3	257,506	256,000	-0.6	1,088,367	1,098,000	0.9
Kentucky	878,617	899,000	2.3	226,967	232,000	2.2	1,105,584	1,131,000	2.3
Louisiana	855,488	877,000	2.5	217,360	219,000	0.8	1,072,848	1,096,000	2.2
Maine	274,353	280,000	2.1	71,937	72,000	0.1	346,290	352,000	1.6
Maryland	887,502	898,000	1.2	140,955	142,000	0.7	1,028,457	1,040,000	1.1
Massachusetts	1,478,036	1,500,000	1.5	194,225	195,000	0.4	1,672,261	1,695,000	1.4
Michigan	2,823,146	2,825,000	0.1	390,164	392,000	0.5	3,213,310	3,217,000	0.1
Minnesota	1,184,373	1,203,000	1.6	261,711	265,000	1.3	1,446,084	1,468,000	1.5
Mississippi	474,623	482,000	1.6	184,052	183,000	-0.6	658,675	665,000	1.0
Missouri	1,265,633	1,291,000	2.0	312,754	314,000	0.4	1,578,387	1,605,000	1.7
Montana	245,207	249,000	1.5	111,138	113,000	1.7	356,345	362,000	1.6
Nebraska	505,293	515,000	1.9	158,778	161,000	1.4	664,071	676,000	1.8
Nevada	112,374	117,000	4.1	34,937	36,000	3.0	147,311	153,000	3.9
New Hampshire	187,873	191,000	1.7	44,516	45,000	1.1	232,389	236,000	1.6
New Jersey	1,890,340	1,907,000	0.9	276,113	281,000	1.8	2,166,453	2,188,000	1.0
New Mexico	279,631	297,000	6.2	98,116	105,000	7.0	377,747	402,000	6.4
New York	4,272,518	4,372,000	2.3	505,131	525,000	3.9	4,777,649	4,897,000	2.5
North Carolina	1,250,185	1,260,000	0.8	312,460	311,000	-0.5	1,562,645	1,571,000	0.5
North Dakota	214,974	223,000	3.7	105,228	111,000	5.5	320,202	334,000	4.3
Ohio	3,350,063	3,418,000	2.0	443,636	445,000	0.3	3,793,699	3,863,000	1.8
Oklahoma	807,278	826,000	2.3	264,488	272,000	2.8	1,071,766	1,098,000	2.4
Oregon	662,822	677,000	2.1	167,804	171,000	1.9	830,626	848,000	2.1
Pennsylvania	3,433,134	3,474,000	1.2	556,165	559,000	0.5	3,989,299	4,033,000	1.1
Rhode Island	281,915	286,000	1.4	38,510	38,000	-1.3	320,425	324,000	1.1
South Carolina	667,644	678,000	1.6	151,799	153,000	0.8	819,443	831,000	1.4
South Dakota	240,263	243,000	1.1	89,444	90,000	0.6	329,707	333,000	1.0
Tennessee	941,346	956,000	1.6	218,696	223,000	2.0	1,160,042	1,179,000	1.6
Texas	3,259,896	3,281,000	0.6	835,566	847,000	1.4	4,095,462	4,128,000	0.8
Utah	294,026	299,000	1.7	75,067	78,000	3.9	369,093	377,000	2.1
Vermont	115,834	118,000	1.9	28,762	29,000	0.8	144,596	147,000	1.7
Virginia	1,129,474	1,154,000	2.2	222,727	225,000	1.0	1,352,201	1,379,000	2.0
Washington	1,010,640	1,030,000	1.9	231,888	237,000	2.2	1,242,528	1,267,000	2.0
West Virginia	475,936	475,000	-0.2	128,805	132,000	2.5	604,741	607,000	0.4
Wisconsin	1,224,697	1,233,000	0.7	254,030	257,000	1.2	1,478,727	1,490,000	0.8
Wyoming	123,801	127,000	2.6	57,328	58,000	1.2	181,129	185,000	2.1
Dist. of Col	175,338	174,000	-0.8	21,400	21,000	-1.9	196,738	195,000	-0.9
Total	55,906,195	56,967,000	1.9	11,229,351	11,431,000	1.8	67,135,546	68,398,000	1.9

1/ These estimates were made by the Bureau of Public Roads on the basis of State reports of motor-vehicle registrations in the early months of 1958, and information available on current trends, motor-vehicle production, and other factors. They include both privately-owned and publicly-owned motor vehicles, except those owned by the military services. Registrations shown for 1957 are from table MV-1, 1957.

USCOMM-DC-48500

Proposed Standards for Outdoor Advertising Signs Announced

Standards for state regulation of outdoor advertising along the Interstate System, prepared in compliance with the 1958 Federal-Aid Highway Act, have been printed in tentative form in the "Federal Register" of August 28, 1958.

Prior to final adoption of the standards, interested parties have 30 days from the publication date to submit for consideration any comments, suggestions or propsals in writing to the Federal Highway Administrator, Bureau of Public Roads, Washington 25, D.C.

The 1958 Act declared it to be 'in the public interest to encourage and assist the states to control" outdoor advertising signs, displays and devices in areas adjacent to the Interstate System where completely new right-of-way has been acquired after July 1, 1956. States agreeing to control advertising in accordance with Federal standards would be eligible for a bonus of one-half of one per cent of the cost of an Interstate System project. Segments of the system within incorporated municipalities or industrial or commercial areas could be excluded from control, but would not be eligible for the bonus.

The proposed standards provide that the only signs permitted within "protected areas" (defined as all areas adjacent to and within 660 feet of the edge of the right-of-way of all controlled portions of the Interstate System) are as follows:

Class 1—Official signs. Directional or other official signs erected in accordance with state law.

Class 2—On premise signs. Signs advertising the sale or lease of, or activities conducted 'on, real property where the signs are located.

Class 3—Signs within 12 air miles of advertised activities. Signs referring to a trade or brand name of any service or product sold more than 12 miles from such sign may not be permitted unless the name and location of the activity within 12 miles handling such product are displayed on the sign more conspicuously than the trade or brand name.

Class 4—Signs in the specific interest of the traveling public. This includes information about public places, natural phenomena, historic sites, areas of natural scenic beauty, camping, lodging, eating, and vehicle service deemed in the specific interest of the traveling public.

The standards permit without restriction, Class 3 and 4 signs in protected areas giving information about historic sites operated by a governmental unit or nonprofit organization.

Other Class 3 and 4 signs may be permitted under certain circumstances in protected areas under the following conditions: (1) no signs visible to traffic proceeding toward an interchange are permitted within two miles of such interchange, (2) in the area two to five miles before an interchange is reached, six signs are permitted (3) in the remaining area between interchanges an average of one sign per mile is permitted, (4) no more than two signs are permitted within any mile and no signs shall be less than 1,000 feet apart, (5) no signs are permitted in scenic areas, and (6) only one sign advertising a single enterprise or place may be permitted on each side of any one Interstate highway.

The standards also authorize the establishment of "informational sites" for erection of additional Class 3 and 4 signs on panels not more than 13 feet high or 25 feet in length. Individual signs on the panel are limited to 12 square feet and must not be legible from the main traveled way or a turning roadway. Animated signs are not permitted, nor illumination by other than white lights.

All Class 3 and 4 signs permitted outside of informational sites are restricted to a size not more than 10 feet high nor more than 60 square feet in area.

General provisions applicable to signs of the Class 3 or 4 type permitted outside of informational sites and Class 2 signs provide they shall not (1) resemble any official traffic device, (2) be permitted to obstruct official signs, (3) contain flashing, intermittent or moving lights, (4) be illuminated in any way to cause glare or impair the vision of a driver, (5) have animated or moving parts, nor (6) be erected on trees, rocks or other natural features.

Oregon's traffic engineering award is shown being examined by W. C. Williams, State Highway Engineer, and Alton Bunderson, district director for the National Safety Council, at the Governor's Traffic Safety Commission meeting on September 10th.

The ITE award shares the spotlight with the National Safety Council's award to Philadelphia's schools at a ceremony in September. L to R: Paul D. Muffley, President, Mid-Atlantic Section, ITE; David M. Smallwood, Commissioner of Streets, City of Philadelphia; Richard A. Overmyer, Deputy Commissioner of Streets, City of Philadelphia; Richardson Dilworth, Mayor, City of Philadelphia; Edward H. Bovich, District Director, National Safety Council; George C. Lowe, Chairman, Traffic Safety Committee, Chamber of Commerce of Greater Philadelphia, and Dr. Allen H. Wetter, Superintendent of Schools, Philadelphia, Pennsylvania.

New Bibliography Lists Downtown Films

A new and unique film bibliography has been issued. It includes 32 selected films on subjects related to downtown modernization and revitalization.

The listing was prepared by the Research Department of *Downtown Idea Exchange*, an organization devoted to redeveloping and promoting the downtown areas of our cities. The films listed are available on free loan for the most part. The major subjects covered include planning, parking, slum clearance, urban renewal, mass transit, downtown marketing and traffic improvement.

The listing is designed to enable downtowners to select films which will inform and generate support among local groups for downtown improvement programs.

Copies are available at 50¢ each from the Research Department, Downtown Idea Exchange, 125 East 23rd Street, New York 10, N. Y.

Delaware's traffic engineering award is handed to Lieutenant Governor David P. Buckson by ITE Executive Secretary David M. Baldwin as Wm. J. Miller, Deputy Chief Engineer, Delaware Highway Dept. (L) and C. T. Foster, Jr., President, Delaware Safety Council, look on.

Wrecker Operations Discussed at N. J. Turnpike Conference

A two-day safety meeting and demonstration of automotive towing equipment was held on September 9 and 10 by the New Jersey Turnpike Authority at New Brunswick, New Jersey. Representatives of each of the forty garages which have contracted with the Authority to provide mechanical, wrecker and towing service to Turnpike patrons attended these meetings.

A major highlight of the meetings was the exhibition of a new wrecker completely equipped with safety devices required in the Turnpike garage contracts. This equipment includes a flashing yellow light rotating through 360°, two flashing yellow lights mounted on the rear of the wrecker, a pair of portable yellow lights which can be mounted on the rear of trucks or other large vehicles when being towed, a fire extinguisher, sand, brooms, rope, and other miscellaneous equipment. It is interesting to note that the Turnpike Authority requires each garage to be covered by liability insurance to the limits of $300,000 to $500,000.

A portable magnesium dolly developed by the Port of New York Authority for movement of heavy trucks which have been disabled with flat tires or broken axles was demonstrated. This device is light enough to be handled by one man and has proved capable of being quickly placed under the wheels of a truck and will allow movement at speeds of five to ten miles per hour.

A Greyhound scenicruiser of the latest type was made available by the Greyhound Company and instructions were given to the garage operators as to the best means of towing these vehicles, checking them for tire changing and for emergency removal of passengers. A tractor-trailer was also made available by Eastern Express, Inc., for demonstration of proper methods of towing.

The afternoon sessions included round-table discussions of the special problems encountered in removing disabled vehicles from the Turnpike.

Waite to Head California Highway Conference

C. E. Waite, California Deputy State Highway Engineer, will serve as general chairman of the Eleventh California Street and Highway Conference, which will meet in Berkeley, Jan. 28-30, 1959. Waite, the deputy for administration and management of the California Division of Highways, is a member of the Executive Committee of the Western Association of State Highway Officials.

The California conference which he will chairman is presented annually by the Institute of Transportation and Traffic Engineering, of the University of California. It is designed for road officials from all governmental levels and for representatives of both public and private organizations having interest in road affairs.

The 1959 conference will provide an expanded program to cover the many local problems growing out of stepped-up schedules and the explosive growth of population and traffic in various California communities. To accomplish this without lengthening the conference, the program will include a series of small-group meetings where practical problems can be discussed in detail by conferees.

Attracting 500 or more individuals, the California conference has become

C. E. Waite

a principal forum for the discussion of matters ranging from broad plans and policies to specific problems and innovations in engineering, construction, and maintenance technique.

Coming Events

November 10-14 — INSTITUTE OF TRAFFIC ENGINEERS—
28th Annual Meeting, Deauville Hotel, Miami Beach, Florida. Contact: ITE, 2029 K St., N.W., Washington 6, D.C.

November 28-December 5—AMERICAN ASSOCIATION OF STATE HIIGHWAY OFFICIALS—
Annual Meeting, Sheraton-Palace Hotel, San Francisco, Calif. Contact: AASHO, National Press Bldg., Washington 4, D.C.

November 30-December 3 — AMERICAN MUNICIPAL ASSOCIATION—
Hotel Statler, Boston, Mass. Contact AMA, 1625 H Street N.W., Washington 6, D.C.

1959

January 5-9 — HIGHWAY RESEARCH BOARD —
Sheraton Park Hotel, Washington, D.C. Contact: HRB, 2101 Constitution Ave., Washington 25, D.C.

January 28-30 — CALIFORNIA STREET AND HIGHWAY CONFERENCE—
11th Annual Conference, Berkeley. Contact: Institute of Transportation and Traffic Engineering, University of California, Berkeley, California.

May 10-14 — AMERICAN SOCIETY OF PLANNING OFFICIALS—
National Planning Conference, Leamington Hotel, Minneapolis, Minn. Contact: ASPO, 1313 East 60th St., Chicago 37, Ill.

September 14-17—INSTITUTE OF TRAFFIC ENGINEERS—
29th Annual Meeting, Commodore Hotel, New York City. Contact: ITE, 2029 K St. N.W., Washington 6, D.C.

Highway Expenditures To Top $6-Billion In 1958, Says BPR

Capital expenditures for highways by all units of government are expected to reach $6.2 billion in the calendar year 1958, according to Bertram D. Tallamy, Federal Highway Administrator. This is an increase of $500 million or 10 per cent above the 1957 total of $5.7 billion. The Bureau of Public Roads also forecast that annual capital expenditures will reach $7.1 billion in 1959, $7.3 billion in 1960, $7.7 billion in 1961, and $8.1 billion in 1962.

Capital expenditures for highways—addition to or improvement of the highway plant—comprise construction (including on-the-job engineering supervision) and preliminary engineering and right-of-way acquisition costs.

During the 5 years 1958-62, Federal-aid funds are expected to provide a rapidly increasing share of the total capital expenditures: 29 per cent in 1958, 40 per cent in 1959 as the expanded Federal-aid program gets in high gear, and a gradual increase to 42 per cent as the program stabilizes. The rate of increase in Federal-aid funds is influenced favorably by the additional $600 million provided in the Federal Highway Act of 1958 for expenditure during 1958 and 1959, and through the temporary suspension, by that act, of the pay-as-you-go clause in the 1956 Highway Act, which otherwise would have required a severe curtailment of expenditures early in 1960 to avoid creating a deficit in the Highway Trust Fund.

Funds available to the States for capital expenditures for highways, both for matching Federal aid and for non-Federal-aid free roads, are expected to increase from $2.6 billion in 1958 to $3.1 billion in 1962. The funds required to match Federal aid are expected to rise from $944 million in 1958 to $1.1 billion in 1962. Capital expenditures by the States in non-Federal-aid work are expected to grow from $1.7 billion to $2.0 billion in the same period.

Capital expenditures by local governments (counties, towns and townships, cities, road districts, etc.), based on past trends, are projected to increase from $1.1 billion in 1958 to $1.3 billion in 1962.

ESTIMATE OF CAPITAL EXPENDITURES FOR HIGHWAYS, 1955-62
(IN MILLIONS)

Calendar year	Federal-aid program: aid Federal	Matching funds	Total	Non-Federal-aid: State	Local	Toll facilities	Federal	Grand total
TOTAL CAPITAL EXPENDITURES								
1955	$ 660	$ 625	$1,285	$1,118	$ 917	$ 937	$ 93	$4,350
1956	770	691	1,461	1,451	969	1,033	99	5,013
1957	1,268	843	2,111	1,428	1,040	958	122	5,659
1958	1,817	944	2,761	1,693	1,095	500	153	6,202
1959	2,811	1,163	3,974	1,583	1,150	176	168	7,051
1960	3,019	1,050	4,069	1,798	1,203	101	170	7,341
1961	3,285	1,097	4,382	1,832	1,261	100	163	7,738
1962	3,434	1,135	4,569	1,965	1,320	75	163	8,092
CONSTRUCTION COMPONENT[1]								
1955	594	563	1,157	883	835	825	81	3,781
1956	685	615	1,300	1,146	875	936	86	4,343
1957	1,076	716	1,792	1,142	945	885	106	4,870
1958	1,348	834	2,182	1,354	1,003	469	130	5,138
1959	2,041	1,023	3,064	1,282	1,057	169	143	5,715
1960	2,141	901	3,042	1,456	1,101	97	145	5,841
1961	2,502	956	3,458	1,484	1,149	96	138	6,325
1962	2,861	1,013	3,874	1,592	1,197	70	138	6,871

[1] Excludes preliminary engineering and right-of-way.

Notable is the expected rapid decline in annual capital expenditures for toll facilities, from $500 million in 1958 to $75 million in 1962. An average of nearly $1 billion was expended annually in 1955-57 for toll facilities. The anticipated decline is, of course, largely due to the advent of the expanded Interstate System program, which will include most of the roads that otherwise might be considered economically sound for toll financing.

Federal capital expenditures for roads in National forests, parks, and other Federal lands are expected to increase modestly from $153 million in 1958 to $163 million in 1962.

Preliminary engineering and right-of-way acquisition costs represent an appreciable part—roughly one-fifth—of the total capital expenditures for highways. Construction expenditures, forecast as rising from $5.1 billion in 1958 to $6.9 billion in 1962, are expected to account for 83 per cent of the total capital expenditures in 1958. It is anticipated that they will drop to 80 per cent in 1960, and then rise to 85 per cent by 1962.

The forecasts for 1958-62 of capital expenditures for highways, and the construction component of these expenditures, are shown in the attached table. Reported expenditures for 1955-57 are also shown for comparative purposes.

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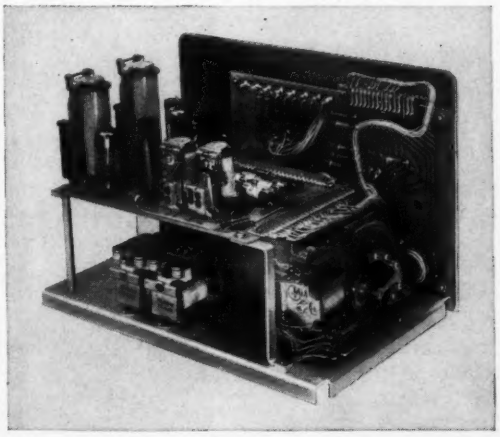

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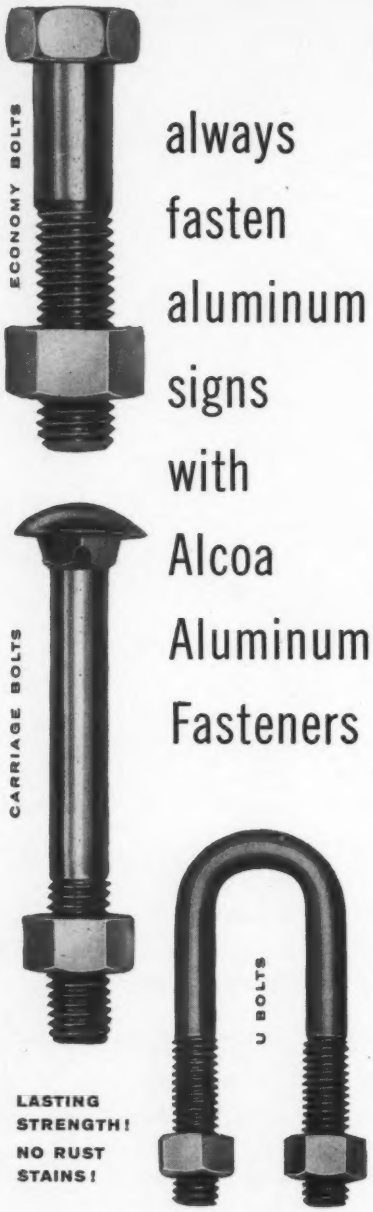
- **Built-in directional detector relay permits direct connection to HRD Detectors**
- **A panel mounted "Detector Actuation" indicator light facilitates adjustment of timing dials**
- **New easy-open case is finished in textured green**

For further details, write for Bulletin C-123

TRAFFIC ACTUATED ®



To stop the rust that stains message films and eats away at holding power, fasten aluminum signs with Alcoa® Aluminum Fasteners. They never rust! There are nuts, bolts and washers for every sign. Call your local Alcoa sales office for details, samples, prices. ALUMINUM COMPANY OF AMERICA, 2235-L Alcoa Building, Pittsburgh 19, Pa.

ALCOA ALUMINUM FASTENERS
ALUMINUM COMPANY OF AMERICA

Your Guide to the Best in Aluminum Value

IRF Awarded Prize By City of Genoa, Italy

The Christopher Columbus International Prize for Communications, given each year for outstanding achievements in transportation and communications, has been awarded this year to International Road Federation.

Announcement of the prize was made in a cable to the federation's Washington office from the City of Genoa, Italy, which makes the award each year. It is given for land transportation every fourth year.

Presentation of the award, including a cash prize of $8,000, was made in Genoa, on Oct. 12. It was presented to Admiral Rickover last year for his outstanding contribution to sea transportation in the development of the nuclear-powered submarine.

The prize, which "shall be bestowed every year to whomsoever has contributed in a remarkable way, by some initiative, discovery or research, during the preceding four years, to the progress of communication among men, be it in the technical or scientific fields or socially, to achieve the shortening of distances and cooperation among peoples," is given by the city and county council of Genoa, Italy.

International Road Federation qualified for the prize because of the achievements in highway transportation the Federation has promoted and encouraged during the past four years.

IRF is a non-profit service organization with headquarters offices in Washington, London and Paris. A total of 64 national roads associations are affiliated with the federation and it is through them that IRF works for better road transportation on the national level while carrying on international programs aimed at achieving better roads for the world.

The Federation also administers grants which allow advanced engineering students to study abroad. So far, 174 engineers from 58 countries have studied advanced highway courses at universities in countries other than their own.

Thirty-three engineers from 23 countries are participating in the fellowship program this year. They are enrolled at Northwestern, Ohio State, California, Purdue and Yale in the U.S. and at Durham and Birmingham Universities in Great Britain.

Outstanding road promotion programs have been carried out on a national scale by IRF's national good roads associations and these also were considered in awarding the prize.

International Road Federation is a highway transportation consultant to United Nations (category B, non-governmental organizations) and is authorized cooperating status by the Organization of American States and the Organization for European Economic Cooperation.

HARRY H. HEMMINGS

Founder

Harry Hemmings (Mem., ITE) died in New York on September 27 after a six months' illness. Mr. Hemmings was one of the founders of the Institute of Traffic Engineers when the organization was formed in Pittsburgh 28 years ago.

An engineering graduate of Cornell University, Mr. Hennings' work spanned the field from hydroelectric design to traffic engineering. He worked as an aeronautical engineer in 1917, and later for the U.S. Navy in the Bureau of Construction and Repair. Later he worked in the hydroelectric field for the International Paper Company.

He was a member of the group that prepared a regional plan for the New York area in 1922 and 1926, and later did similar work in Louisville, Ky.

For the past 28 years, Mr. Hemmings had been an engineer and executive with the Metropolitan Life Insurance Company and for several years served as adjunct professor of civil engineering at Brooklyn Polytechnic Institute. He was 62 years old.

Positions Available

TRAFFIC ENGINEER

Graduate Engineer with at least one year of traffic engineering experience or education. Experience in highway engineering desirable but not necessary. Live in or near Boston.

Salary: Commensurate with experience & ability.

Apply: Clarkeson Engineering Co., Inc., 285 Columbus Ave., Boston.

PHOENIX, ARIZONA

Position: Assistant Traffic Engineer.

Requirements: Graduation from recognized college or university with specialization in traffic engineering, and with experience in traffic engineering work.

Salary: $460 to $475 per month.

Apply: Before November 17, 1958 to Leroy J. Brenneman, Personnel Director, City Hall, Phoenix, Arizona.

New Appointments

Tarbox Named Ohio State Traffic Engineer

Fred C. Tarbox (Member, ITE) has been named chief of the Ohio Department of Highways' Traffic Bureau. In this position he succeeds the late Harold Eckhardt.

Tarzox's duties include design and construction of road signs and responsibility for determining the need for the installation of all traffic control devices such as stop signs, traffic lights and pavement markings.

Tarbox was with the Department in various capacities between 1932 and 1943, except for a 1937 leave of absence to take advantage of a study fellowship in the field of traffic at Harvard University.

He was again with the Department in 1950-51. He has also held various posts with several trucking firms in Cleveland and Columbus.

Tarbox was graduated from the University of Akron with a civil engineering degree in 1934. He has done advanced work at Ohio State University, Fenn College and Findlay College.

R. M. Swetland Retires From General Electric After 35 Years

R. M. Swetland of Hendersonville, N. C., has retired after more than 35 years of service with the General Electric Company.

Mr. Swetlend was senior illuminating engineer for the company's Outdoor Lighting Department at the time of his retirement. Following graduation from Bucknell University with a Bachelor of Science degree in electrical engineering, he joined General Electric in 1923 as a member of the company's Test Course. The following year, he was assigned to the Illuminating Engineering Laboratory and subsequently devoted the remainder of his career to work in the outdoor lighting field.

Mr. Swetland is a member of the Illuminating Engineering Society and Tau Beta Pi honorary engineering fraternity. He is a registered professional engineer in Massachusetts.

As a member of the IES, Mr. Swetland was chairman of the Tunnel and Underpass Lighting Subcommittee and served on the Roadway Lighting Committee. He supervised the preparation of the IES bulletin "Lighting Traffic Tunnels and Underpasses," was one of three General Electric consultants for a chapter on Street Lighting Systems in the Edison Electric Institute's recently issued "Underground Systems Reference Book," and has authored many technical articles and lighting application reports.

McMonagle Heads Good Roads Group

Newly elected president of the Michigan Good Roads Federation is J. Carl McMonagle, assistant director in charge of field services of the M.S.U. Highway Traffic Safety Center, and past president of the Institute of Traffic Engineers. McMonagle succeeds Stanley M. Powell of Ionia, Michigan Farm Bureau legislative agent.

Kunde and Staff Shift From City of Miami To Dade County

George H. Kunde (Assoc. Mem., ITE) has been appointed Director of the Dade County (Florida) Department of Traffic and Transportation. This is a new operation, which is expected to eventually become the base for the traffic and transportation function of the new metropolitan government of the area.

Kunde, who has been city traffic engineer in Miami for several years, moved to the County in early October. Joining him in the change were Donald L. Smith (Assoc. Mem., ITE), who has become Assistant Engineer in charge of Traffic Operations, and David Reynolds, Assistant Engineer in charge of Public Transportation. Both Smith and Reynolds had been associated with Kunde in the City Traffic Engineering Division.

Also joining the new operaion is John W. Barr (Jun. Mem., ITE), as Assistant Engineer in charge of Traffic Planning. Barr was earlier employed by the Florida State Road Department.

The new organization is temporarily housed at 1357 NW 11th Street, Miami. It is expected that a new building will be constructed to house the growing operation in a short time.

George Masefield Shifts from Tassco to P & K

George Masefield, formerly with Traffic and Street Sign Company, has joined the staff of Pfaff and Kendall. He will work as liaison between P&K's new highway planning committee and the many government agencies involved in highway lighting and signing.

George Masefield

JOB CHANGES

Robert E. Barkley—from the Chattanooga Housing Authority to Greensboro, North Carolina as Executive Director of the Redevelopment Commission.

Edwin F. Colby — from the City of Providence, R. I., to Bruce Campbell & Associates, Boston.

William R. Crockett—from the U. S. Bureau of Public Roads, Washington, to Wilbur Smith & Associates, Columbia, South Carolina.

James R. Guthrie—from the City Planning Commission, Columbus, Ohio, to Headquarters, U. S. Army Transportation Terminal Command, Pacific, at Ft. Mason, California.

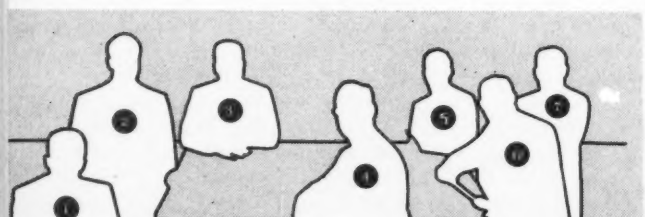
Louis E. Keefer — from the Chicago Area Transportation Study to the Pittsburgh Area Transportation Study as Chief Traffic Engineer.

Thomas J. Killeen — from the Detroit Department of Streets & Traffic to the Department Report & Information Committee of Detroit as Head Publicist.

Philip M. Linscott — from DeLeuw, Cather & Company to Daniel Mann, Johnson & Mendenhall, Los Angeles, as Public Works Consultant.

Frank S. Vukovits — from the City of South Bend to the Indiana State Highway Department in Indianapolis as E. I. T. Survey Engineer.

This P & K-TASSCO highway committee offers mor



For state highway departments and their consulting engineers

In any highway signing or lighting program there's no margin for error. At Pfaff & Kendall and at their associate company, Traffic & Street Sign Company, signing and lighting means delivering thousands of units—signs, sign supports, standards, and luminaires—as specified. To do this, it takes the workings of this skilled seven-man team. Each man, a recognized specialist in some phase of this work, is at your service.

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Divisional Sales Manager of Pfaff & Kendall, specializing in sign spans, signal spans and traffic signal standards.

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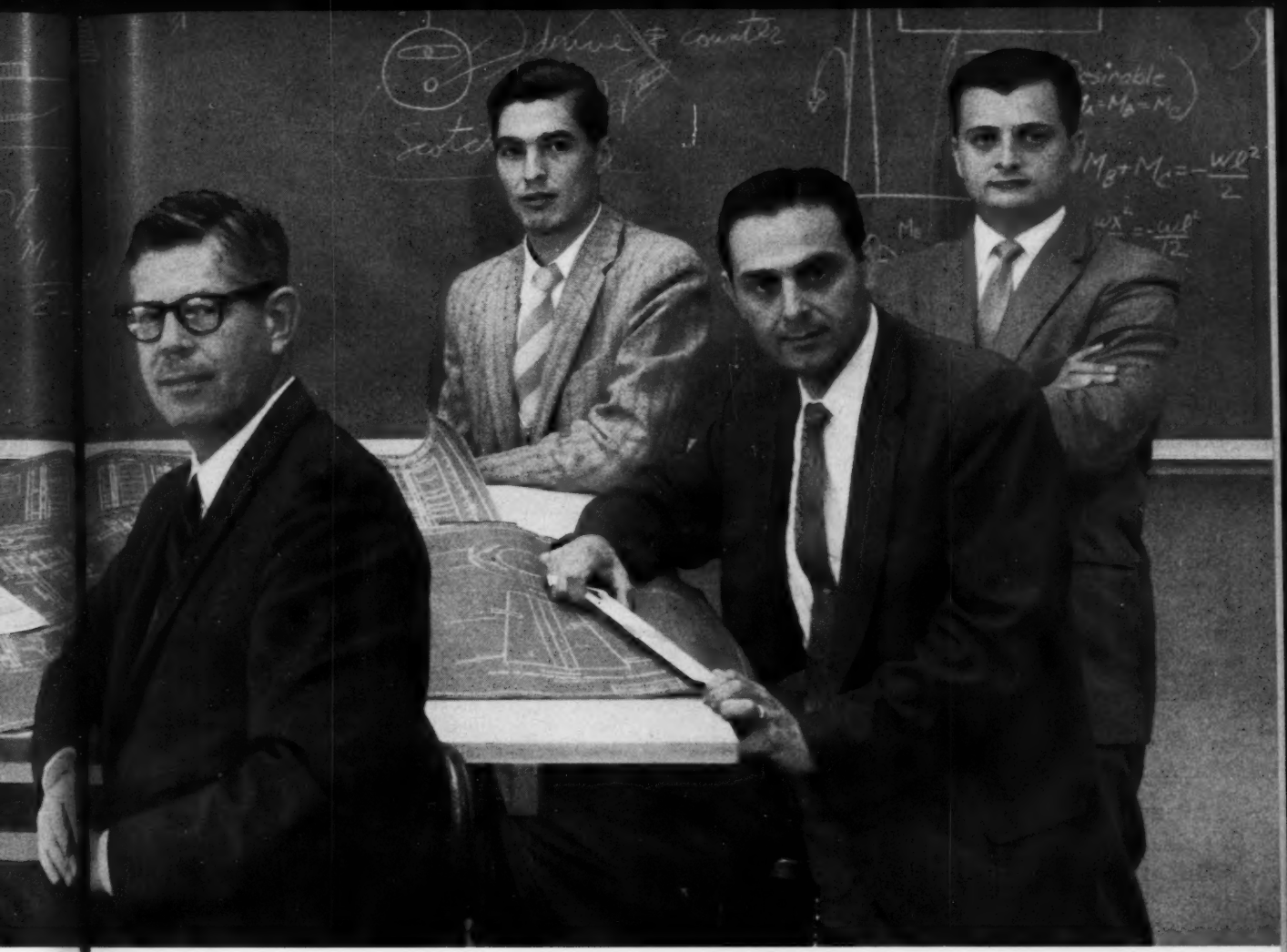
GEORGE MASEFIELD
Committee Coordinator known over the country, available for consultation at any time.

DICK SIVER
Professional E[illegible] perience in t[illegible] operations.



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Do you have anything in the planning stage or even in the preliminary discussion stage? This is the best time to take advantage of our committee. Make it your committee. Utilize its accumulated experience. Write today–address your request to "Committee".

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Sales Promotion Manager of Pfaff & Kendall, offers a vast store of photos, movies, facts and figures covering installations all over the country.

Traffic Engineer In D.C. Moves to Highway Dept. In Reorganization

The traffic engineering function in the District of Columbia has been moved from the former Department of Vehicles and Traffic to the D. C. Highway Department, now known as the Department of Highways and Traffic.

Wallace L. Braun (Member, ITE), who had been Deputy Director of the Department of Vehicles and Traffic, is now Deputy Director in charge of Traffic Engineering and Operations of the Department of Highways and Traffic, under Director John N. Robertson.

John Mitton (Member, ITE), who had been in the old Department, is now Traffic Engineer for the Department of Highways and Traffic. Others moving to the new Department include: I. J. LoJacono (Assoc. Mem.); Charles R. Sullivan (Assoc. Mem., ITE); and William H. Voltz (Member, ITE).

PROMOTIONS and TITLE CHANGES

O. J. Falin — from City Traffic Engineer to Director of Traffic, Kansas City, Missouri.

Roger E. Kuehl—from Associate Traffic Engineer to City Traffic Engineer, Kansas City, Missouri.

Armand L. Phaneuf — from Senior Civil Engineer to Liaison Traffic Engineer for the Traffic Engineering Division, Massachusetts Department of Public Works at Boston.

Harold L. Shahan — from Assistant District Traffic Engineer with the Washington Department of Highways at Olympia, to District Traffic Engineer at Yakima.

David P. Swanson — from District Traffic Engineer with the Washington Department of Highways at Yakima to District Design Engineer.

William E. Tucker — from Traffic Engineering Survey Analyist, Colorado Department of Highways, Denver, to Assistant Highway Engineer.

Strictly Business

Aluminum Railing of New Type Used in Baltimore

Strolling pedestrians and heavy city traffic on Baltimore's new Calvert Street Bridge today are being protected by one of the most unusual aluminum barricade railings ever designed.

Recently opened to the public, the new structure spans a section of electrified railway, and is an important connection in the new Jones Falls Expressway. With high tension wires just under the bridge, a barricade was needed to protect both users of the span and the wires below.

The new aluminum railing filled this need for a low-cost, low-maintenance aesthetic design. Engineered by Rummel Klepper and Kahl, Baltimore, Maryland, in cooperation with Aluminum Company of America's sales development division and the L. B. Foster Company, Pittsburgh, fabricators of the railing, the new installation utilizes unique aluminum extrusions and sand cast aluminum posts.

The extrusions were produced with an inside nine-foot radius, and are complete with artistically curved flutes. To form the barricade, six of these sections were "stacked" atop each other

to form a panel 54-inches high and eight-feet long. The complete panels were then fastened to the posts.

Over 150 sand cast posts were used with their front face curved to the same radius as the extruded panels. Aluminum fasteners were used throughout the system. The posts are on eight-foot centers atop a two-foot-high concrete parapet.

A total of 1,115 lineal feet of the new railing is in use on the span. More than 27,500 pounds of aluminum were consumed.

Due to low first costs of the railing, Alcoa expects the design to be adopted in many similar projects. The system is strong enough to resist traffic, yet high enough to protect the wires from objects that might be dropped from the bridge.

Pulse-Input Digital Recorder for Traffic Counting Offered

A new digital recorder for traffic counting has been announced by Fischer & Porter Co., Hatboro, Pa., instrument manufacturer. Traffic flow during any preselected time interval may be readily measured. Operated by electrical impulses from a conventional road treadle, the new recorder produces a permanent record on punched paper tape. The tape recorder is easily interpreted visually or is suitable for use with automatic data processing machines.

The unit is an adaptation of F&P's Digital Demand Recorder, which has a record of proved performance in demand recording and load survey work for electrical utilities. It is offered with standard time intervals of 5, 15, or 60 minutes. Other intervals are available and interval changes are easily accomplished by the user.

Further information is available from Fischer & Porter Co., 911 Jacksonville Road, Hatboro, Pa.

Dietz Transistorized Flasher Has 7″ Lens

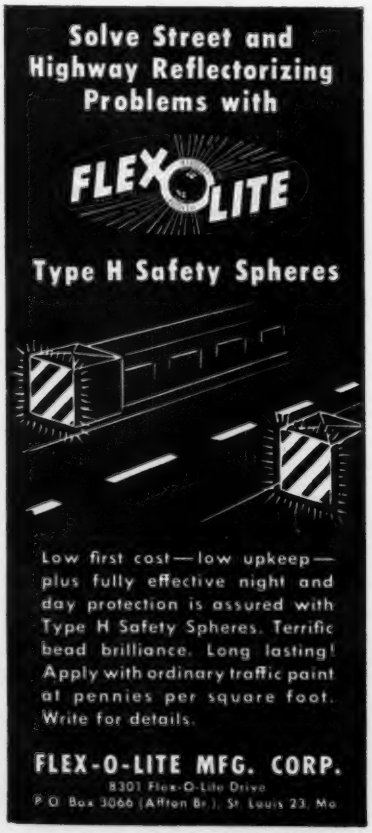
Designed to meet highway hazard warning specifications of those states having special wide-diameter lens requirements, this new Dietz electronic flasher provides wide-angle visibility over the entire width of the road. For use by construction concerns, city and state highway departments, police, fire departments, utilities and similar organizations, this Model #697 has two plastic shock resistant 7″-diameter lenses to provide warning from both directions.

The unit's patented transistorized circuit contributes to compactness and ruggedness of design, and permits a longer, trouble-free life, according to

the maker. Functioning perfectly after life-tests of over 18,000 working hours at full power, the transistors also successfully meet the shock test of being fired from a mortar. The #697 flasher has been pre-tested to operate under extreme temperature ranges and moisture conditions.

The new electronic warning light, 16 candle-power, operates at 6 volts, using two standard electric lantern batteries with a life of at least 1500 hours. Preset flashing rate is 60 to 80 times per minute. The transistorized circuit and regulated flashing rate permits a longer dwell time (period of light), which contributes to the flasher's high attention-getting visibility.

Additional information of the Ditez #697 is available by writing to Portable and Hazard Lighting Division, R. E. Dietz Company, 225 Wilkinson St., Syracuse, New York.


Solve Street and Highway Reflectorizing Problems with
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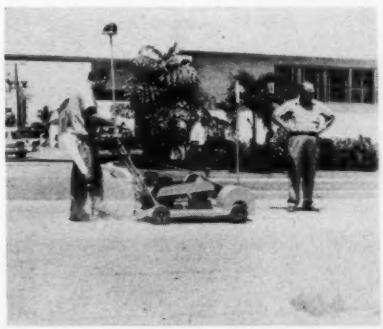
Type H Safety Spheres
Low first cost—low upkeep—plus fully effective night and day protection is assured with Type H Safety Spheres. Terrific bead brilliance. Long lasting! Apply with ordinary traffic paint at pennies per square foot. Write for details.
FLEX-O-LITE MFG. CORP.
8301 Flex-O-Lite Drive
P. O. Box 3066 (Affton Br.), St. Louis 23, Mo.

Traffic Lines Removed By Asbury Shaver

The Asbury Traffic Line Shaver is reported to be a fast, practical way to remove at low cost unwanted traffic lines painted on roads, streets and airfields.



The machine, a rotary drum containing specially constructed pivoted cutters, is powered by a 6-H.P. variable speed gasoline motor. It operates on concrete or blacktop at a speed in excess of ten feet per minute depending on the surface, and covers a six-inch path.

One model is available with a reversing gear transmission which means self-sharpening cutters.

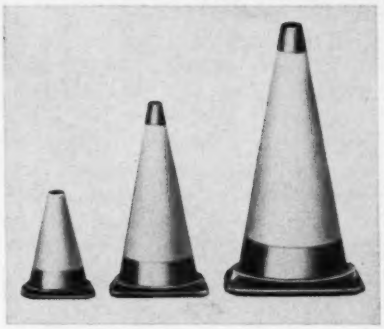
The estimated cost of removal of lines with this equipment is set at from 4¢ to 6¢ per foot.

For more information, write: Artex Welding and Fabricating, Traffic Division, 824 NW 9th Ave., Fort Lauderdale, Florida.

Traffic Cones Offered by Philadelphia Company

Industrial Products Company announces a new line of traffic cones for traffic channeling on the streets and highways, for guarding construction and repair operations and many other uses.

Made of tough, durable rubber to withstand hard wear and abuse, the cones are finished with special rubber base paint in yellow, black and red color combination, plain or reflectorized. Three sizes are available — 12", 18" and 24".

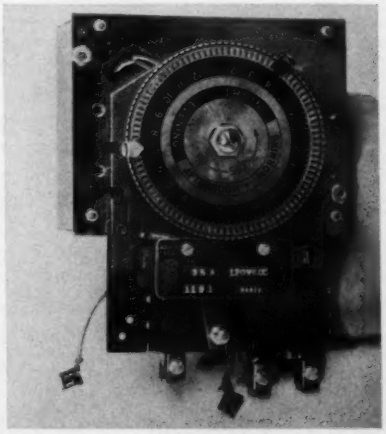


Shell type construction allows for stacking, requiring minimum space when not in use. Signs and flags are available that may be inserted in the top opening of the cones.

Full information may be obtained by writing to Industrial Products Company, 2944 N. Fourth Street, Philadelphia 33, Pa.

Reserve-Power Time Switch Available for Traffic Signal Control

The availability of what it terms "the first fool-proof reserve power" on time switches has been announced by Tork Time Controls, Inc. The unit was designed to meet the need of municipal signal and lighting engineers for the continued operation of time controls in the event of power failures. Now, no readjustment of time switches is needed when power is restored.



The reserve action is provided by a powerful spring, electrically wound by the time switch. A special release, exclusive in the Tork switch, mechanically exercises the reserve spring daily. This regular exercising keeps the reserve in factory-fresh condition.

When power fails, the Reserve takes over and keeps the time switch in operation for up to 17 hours. With power restored, normal AC operation of the time control is resumed, and at the same time, the Reserve spring is rewound. There's never a need for manual rewinding—it's automatic.

The reserve is available on all Tork time switches used for the control of street lighting and traffic signals, including astronomic models, 24-hour dials, and multiple-program switches. Further information is available, without obligation, from the manufacturer. Inquiries should be directed to: Municipal Division, Tork Time Controls, Inc., Mount Vernon, New York.

New Publications

A Career for You in Highway Engineering

Joint Committee, AASHO and Highway Div., ASCE, 200 Ring Building, Washington 6, D.C. 24 pp.

To help head off possible future shortages of highway engineers and technical specialists, a new booklet is now ready for widespread distribution in high schools.

Sponsored by a joint committee of the Highway Division of the American Society of Civil Engineers and the American Association of State Highway Officials, it is expected that distribution to high school students will be made principally by the state highway departments.

Heretofore no publication covering highway engineering has been generally available to high school students. Written for quick reading and well illustrated, the committee is hopeful that the booklet will encourage more students to enter civil engineering, particularly the highway field. The demand for engineers and technicians, the committee believes, will increase materially as population, motor vehicle ownership and highway programs get bigger.

The initial limited edition was made possible by a grant and staff services of the Automotive Safety Foundation, Washington, D.C.

The booklet project was developed by the Committee on Highway Engineering Manpower of the Highway Division of ASCE. Later, the joint committee made the booklet a cooperative project.

Members of the joint committee are: (Co-chairman) Rex M. Whitton, Chief Engineer, State Highway Commission, Missouri; Professor Harmer E. Davis (Co-chairman) Institute of Transportation and Traffic Engineering, University of California; C. R. McMillan, Chief Highway Commissioner, State Highway Department, South Carolina; John W. Johnson, Superintendent of Public Works, New York; Dwight H. Bray, State Highway Engineer, Kentucky; George T. McCoy, State Highway Engineer, Department of Public Works, California; William A. McWilliams, DeLeuw, Cather & Brill; Arch N. Carter, Lindsey, Carter and Associates; Earle V. Miller, Johannessen & Girand and Earle V. Miller; and J. P. Buckley (Secretary) Chief Engineer, Highways Division, Automotive Safety Foundation.

Accidental Injury Statistics

Division of Special Health Services, U.S. Department of Health, Education and Welfare, Washington 25, D.C. 1958. Single copies free (limited supply).

Figures used in the report are based on National Health Survey data collected in sample household interviews, on statistics provided by the Office of Vital Statistics, and on information contained in several selected studies of

FLEXIBLE FIN TRAFFIC CONTROL

Efficiently relieves traffic tie-ups during

RUSH HOURS
SPECIAL EVENTS
DETOUR RE-ROUTING
and
SEASONAL TRAFFIC

An entirely new departure in design and principle, **Flexible Fin** Lane Dividers can be used when and where needed to relieve traffic congestion caused by unequal traffic flow. Four lane streets normally marked for a 2:2 lane ratio of traffic flow can be easily converted during heavy traffic flow periods to a 3:1 lane flow in either direction. Conversion on three lane streets and wide two lane streets is equally simple.

Flexible Fin Lane Dividers provide Traffic Engineers with these important advantages:

- **MAXIMUM TRAFFIC FLOW FROM EXISTING STREETS IN THE DESIRED DIRECTION AT THE DESIRED TIME**
- **ELIMINATION OF INADEQUATE AND HAZARDOUS POST, FLAG AND OTHER TEMPORARY TYPE LANE MARKERS**
- **MINIMUM MAINTENANCE CREWS AND POLICE MANPOWER TO EFFECT EFFICIENT TRAFFIC CONTROL**

The use of **Flexible Fin** Lane Dividers also eliminates many costly street widening projects and resulting traffic tie-ups during such construction.

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Send for further information and literature.

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Join us in our hospitality suite at the Deauville Hotel, Miami during the ITE Convention. Check the bulletin board for room number.

BE SURE TO COME UP AND SEE OUR 15 MINUTE SOUND FILM ON TRAFFIC CONTROL

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WORLD'S NORTHERN-MOST PARKING METER INSTALLATION

DUNCAN-MILLER 60

● REYKJAVIK, ICELAND, a stone's throw from the arctic circle, have installed DUNCAN-MILLER meters to control parking traffic.

Iceland can't get too cold for rugged Duncan-built products. Their reliability and dependability have been proved in installations throughout the world.

"Motorist energized" instead of dependent upon city personnel for periodic winding, DUNCAN-MILLER performance is unmatched in economy and long serviceable life regardless of climatic conditions.

WRITE TODAY!

DUNCAN PARKING METER
DIVISION OF
MOTOR PRODUCTS CORPORATION
Chicago 22, Illinois

M-3's design is simple inside as well as out. Swing-away doors and snapout reflector assemblies open quickly... give easy access to uncluttered interior... plenty of room for maintenance work.

Faston connectors for easy removal or replacement of lamp receptacle.

Neoprene door gasketing for weather and water-tight seal.

New Crouse-Hinds M/3 Traffic Signal

meets revised I. T. E. specifications with completely new optical system!

With improved lenses for better light distribution . . . high-polish Alzak aluminum reflectors to eliminate sun phantom . . . adjustable-focus receptacles to permit compensation for lamp variations . . . the new M-3 more than meets the latest Institute specifications!

Simplicity of design keynotes this light, versatile 8″ signal. Sectional construction enables assembly of 1, 2, 3, 4 or 5 sections, each section self-contained with integral top and bottom. It may also be assembled with sections of the standard 12″ signal.

Installation is easier, more flexible. Servicing is faster. One-piece reflector assemblies snap in, snap out.

The smooth, clean lines of the all-new die-cast aluminum body offer less resistance to the wind, provide a sleek modern appearance.

Send For Free Booklet and complete information on the new M-3 Traffic Signal.

● **For engineering and service assistance: Crouse-Hinds maintains a nationwide network of sales engineers and distributors conveniently located to assist you in engineering and service situations. For the name of the Crouse-Hinds representative nearest you, call or write any office.**

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Crouse-Hinds Instrument Company, Inc., Silver Spring, Maryland

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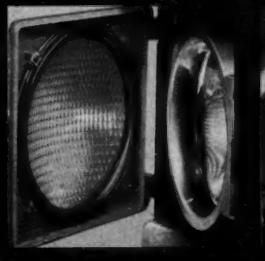
Square head set screws with all fittings.



Dust-tight seal for optical sytsem is special blend of synthetic rubber gasket around lens . . . heat resistant, with excellent weather aging qualities.

Bayonet slots in hoods for quick installation and replacement.

Locking rings lock signal head to bracket arm in 5-degree steps.

Bushing nut with Buna-N "O" ring for water-tight connections of signal head to bracket arm.

accidental injuries. Included are figures on incidence of non-fatal injuries, leading causes of death, trends in accidental deaths as recorded over a 50-year period, types of accidents, and relationship of accidents to marital status and place of residence.

The publication reveals, through a 40-year record, little change in the number of accidental deaths for the population as a whole. It indicates that approximately 50 million persons per year are injured in accidents, 40 per cent of which occur in the home. Approximately two-thirds of these home accidents take place inside the house, over 20 per cent of them in the kitchen. Other figures in the report demonstrate the staggering number of man-years lost through accidents.

Data contained in the report make apparent the dreadful toll accidents are exacting in lives of youth. While death rates in age groups up to 35 due to such diseases as tuberculosis, influenza, pneumonia, typhoid fever, and heart ailments—all major killers in 1900 — have shown a steady and dramatic decline, the rate of accidental deaths in this age group has remained relatively steady, claiming almost 35,000 lives in 1956.

Figures on deaths from the various types of accidents are also presented for each State in the United States in this report.

The Accident Prevention Program plans to revise "Accidental Injury Statistics" annually, including new data as it becomes available. Publication may be more frequent, depending upon needs.

Yearbook Changes

BARR, John W. (Junior)
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Membership Applications

APPLICATIONS FOR TRANSFER

ADAMS, George S.
Highway Engineer, Georgia State Highway Department, #2 Capitol Square S. E., Atlanta, Georgia. September 8, 1958 for ASSOCIATE grade.

COLEMAN, Captain James E.
Special Projects Officer (Highway Traffic Engineer), Office of Chief of Transportation, Department of the Army, Washington 25, D. C. October 7, 1958 for ASSOCIATE grade.

DIERSTEIN, Philip G.
Traffic Maintenance Supervisor, Illinois State Toll Highway Commission, 22nd Street & Midwest Road, Hinsdale, Illinois. September 11, 1958 for ASSOCIATE grade.

GAYMARD, Ludovic
Chief Engineer for Lighting & Traffic Lights, Electricite de France, 7 rue Antoine Bourdelle, Paris, France. September 15, 1958 for MEMBER grade.

HENDRICK, Roe P.
Traffic Engineer, Bruce Campbell & Associates, 177 Milk Street, Boston, Massachusetts. October 7, 1958 for ASSOCIATE grade.

KEEFER, Louis E.
Chief Traffic Engineer, Pittsburgh Area Transportation Study 14 Wood Street, Pittsburgh 22, Pennsylvania. October 2, 1958 for ASSOCIATE grade.

KOERT, Adrian H.
City Traffic Engineer, City Hall, Des Moines, Iowa. October 9, 1958 for MEMBER grade.

PIEDRAHITA, Jose A.
Consulting Traffic Engineer, City, Carrera 19 #11-17, Bogota, Colombia, South America. October 6, 1958 for ASSOCIATE grade.

NEW APPLICATIONS

ANSLEY, James L.
Assistant Senior Traffic Engineer, Dallas Traffic Control Department, Room 405 City Hall, Dallas, Texas. October 2, 1958 for ASSOCIATE grade.

ARES, Aristotle
Assistant Engineer, Office of the City Engineer, Miami Beach, Florida. September 29, 1958 for ASSOCIATE grade.

(Continued on page 55)

Section News

WESTERN SECTION

Oregon Area

A one-week "Fundamentals of Traffic Engineering" course was held at UCLA August 25-August 29. Two of the boys from Portland, Tom Neely, Mario Martini and one fellow from Multnomah County, Richard Lulay, attended. Skinny DeYoung, who lives near where the boys stayed, taxied them to and from school and took care of them in general. The week-long school kept them pretty busy, but they were able to see some of the sights of the Los Angeles area too.

A Traffic Fundamentals class is scheduled to be held one evening a week at Portland State College starting September 30. Professor Coopey of Oregon State College will be in charge. Tentatively, eleven men from Multnomah County, as well as quite a few from the City of Portland, plan to attend.

Harlan Baxter, Eugene Traffic Engineer, has acquired equipment for a completely new sign manufacturing shop, and has had an assistant working with Mr. Widdows becoming proficient in the art of sign making. Congratulations Harlan, now with all those new signs the Highway Department will not have to by-pass Eugene.

The Traffic Control Section of the State Highway Department has two new recent Oregon State College graduates who will be potential ITE members: Ron Failmezger and Don Adams.

Last month John Henberger was in Salem bidding farewell to his many Oregon friends. John is going into business for himself and we wish him good luck in his new enterprise.

Inter-Mountain Area

Denver's Traffic Engineering office was host, on August 18-19, to Derek Wolfall of Kenya, East Africa. Derek stopped here to review our traffic system enroute to Berkeley, California. He is to attend the ITTE for the next 18 months.

The split phase timer used in Denver to control the leading green indications has had a recent modification. An additional piece has been added to it to provide a clearance interval following the leading green before the release of opposing traffic. For want of a better name, the manufacturer has called it "Brown's Sloejoe Controller."

Another bottleneck in Denver's traffic has been greatly relieved with the opening of another short section of the Valley Highway from Third Avenue south past Alameda. This had been a major thorn to many Denver drivers for the past 18 months.

Al Pepper's office reports another signing contract is soon to be let for an additional twenty miles of the Interstate System. They are also rapidly approaching the 7,000 mile point of speed zoning on the State's 8000 miles of State Highways.

Arizona-New Mexico Area

In Phoenix the big item this month is schools. During the latter part of August and early September, all school zones within the city were repainted and school signs reconditioned as necessary. For the benefit of those members of the Institute who have not visited Phoenix during the school year, over sixty 15 MPH school zones have been established. Portable signs are erected in the streets reading "School in Session, 15 Miles Per Hour." Public support to these school zones is excellent. The Police Dept. advises that enforcement is no problem as the public discipline themselves to this reduced speed. It is realized that as Phoenix grows in population and subsequent congestion increases, school zones may be things of the past. At the present time, however, the use of these signs has been quite successful.

A new speed limit ordinance has been adopted in Phoenix. This was brought about by the recent annexation. Speed surveys were made on all of the newly annexed arterials and on other streets where they were felt needed. A radar speed detector belonging to the Police Dept. was used for this purpose.

The City of Phoenix recently had visitors from Japan, several South American countries and other foreign countries interested in traffic engineering.

Arnold Johnson was awarded a five-year citation by the President of the United States for draft board services. Draft board pay is about the same as the pay of the Area Chairman.

The following, taken from the Denver Post, shows that you can never tell what a woman will do:

DO IT YOURSELF SIGNS
NIXED IN ALBUQUERQUE

"Mrs. Wilhemina Coe, real estate saleswoman, has lost her third skirmish with the City of Albuquerque over erecting her personal speed-warning signs in a residential area. Mrs. Coe, 53, was arrested late Monday and charged with erecting and displaying unauthorized signs.

"Mrs. Coe admitted that she erected the signs, as she has done on two other occasions, to correct a 'sad speeding situation.'

"She said further that she had assured parents to whom she has sold property in the area that their children would be protected against speeding cars.

"She immediately posted bond and then threatened to put up more signs. The real estate operator has already paid two $50 fines in Police Court on the same count."

San Diego Area

Marty Bouman reports that a search is on for a boat detector. It seems the San Diego Harbor Dept. is loking for a simple way to determine how many small boats are launched at the Shelter Island Ramp daily (ADB). The Harbor Dept. didn't take kindly to his suggestion that they post a port policeman at the loading ramp and have him count all automobile and trailer wheels and then divide by six.

San Diego Public Works crews, under the direction of Electrical Division Supt. Al Keith, set a record of some kind when they completely constructed and placed in operation a temporary traffic signal on a divided highway in one-half day. It was needed for trucking operations on the emergency construction of a sewage ponding basin. The installation of "No Swimming" signs at the basin has been ordered by Jim Reading's office.

The City has at last found a use for their stock of defunct metal trolley poles. These poles will be used at five temporary signal locations which are scheduled for later widening and improvement.

Traffic delays due to highway construction are keeping the telephones buzzing at City Hall these days—seems that large scale rip-em-up projects on Washington Street, El Cajon Blvd., 6th St. Extension, Cabrillo Freeway (US395) and Camino Del Rio (US80) are somewhat exasperating to the public. All these projects are on major streets or freeways in the same general area. Motorists are being advised to detour by way of Tijuana. (To see the bull fights, no doubt!—Ed.)

The installation of interior illuminated signs designating the end of one-way streets has begun in San Diego. Signs are being placed in islands facing traffic about to enter the one-way system. Knock over rate on the old non-illuminated signs has been extremely high. It is expected that the new signs will solve everything. An optimistic outlook at the least.

Jim Reading's office announced the promotion of John Tsiknas to Associate Traffic Engineer. Congratulations John!

From limited experience at four intersections during the past year, Paul Fowler reports adoption of 12-inch traffic signal heads as a San Diego County policy for all mast arm and green arrow indications on future signalization projects. Accident experience, target value and public comments in general have proven favorable. (To say nothing of a recent price reduction by the manufacturer.)

The California Division of Highways has submitted its report recommending a statewide freeway system to the California Legislature. This report and the study upon which it is based were authorized by the Legislature in Senate Concurrent Res. #26. The District XI portion of this report culminates over two years of work by the District Traffic Department and includes a comprehensive O-D Analysis for the San Diego Metropolitan Area for the year 1980. The traffic distribution technique used was included in the paper presented by Bill Galland at the Western Section Convention at Sacramento in June. This work represents a cooperative effort by all cities within the area and the county of San Diego. The inter-jurisdictional cooperation was integrated to a large extent by San Diego Metropolitan Transportation Research.

District XI is now in the process of changing the proposed signing on its portions of the Interstate System now under construction to the Interstate standards.

MID-ATLANTIC SECTION

ITEms About the Members

Officially, Gene Simm, Traffic Engineer of the City of Harrisburg, describes the new traffic setup in downtown Harrisburg as follows:

"The Traffic Engineering Bureau of the City of Harrisburg put the new 'Downtown Traffic Improvement Plan' into effect at about 3:30 P.M. Sunday afternoon, August 31st. The 'plan' provides a new signal control system with progressive timing, protected pedestrian intervals, overhead lane indications, etc. The first few hours were 'hell-on-wheels.' However. I am pleased to report that within the week the pattern had smoothed out, driver and pedestrian performance is at a high level, and public reaction has been very good. The traffic Engineering Division of the city is very gratified at the results of the new plan."

Philadelphia was recently the recipient of two awards, the City Streets Department receiving the National Safety Council's award based on the 1957 inventory of traffic

safety activities, and the Streets Department also receiving the Institute of Traffic Engineers award on the basis of its engineering record. In the latter award the Section was represented on both sides of the ceremony. Our Section President, Paul D. Muffley, presented the plaque on behalf of the Institute to City Streets Commissioner David M. Smallwood and our Presidential Nominee, Deputy Streets Commissioner Richard Overmyer.

The outing at the shore at Hawley Simpson's summer home "The Boathouse" on July 25th was just what certain overworked and under-rewarded traffic engineers needed to make it through the dog days. Everyone had a wonderful day at an easy relaxed pace, with a few exceptions as follows:

Paul Muffley couldn't take a full day of relaxation so he hurried back to Harrisburg to get some work in before the day ended. Lew McIntyre kept saying "It's slightly overexposed" although the picture looked good to everyone else. The gulls had both potato chips and Herb Taylor thrown to them, but they threw him back. Dave Smallwood made quite a picture floating by with the tide, with one gull perched on each foot. The athletic laurels went to Harry Parrish for his exhibition of water skiing. He isn't much of a teacher or Mike Ferrari isn't the best student. Dick Overmyer was actually energetic about playing cards all day. Dave Baldwin really came through at the bridge table.

For the unfortunates who were unable to make it, "The Boathouse" is a treat in itself. The size and architecture make it appear on the outside to have been an old Coast Guard building. On the inside it is a very attractive livable house. The living room, with a two story vaulted ceiling, is reminiscent of an old English manor. The furnishings are a story unto themselves and the origin of the house is better yet. Ask one of the lucky ones who knows.

Dick Overmyer hopes that all interested parties will arrange to see Philadelphia's new electronically controlled signal setup for center city when the section comes to the city again for a meeting. Although still far from completion well over 200 intersections are already connected to the system.

The City of Lancaster, Pennsylvania, will receive the Institute of Traffic Engineer's award on the basis of its traffic engineering record for 1957, as reported to the National Safety Council, Tuesday evening, September 23rd. As in Philadelphia, your President will present the award for the Institute. The plaque will be given Mr. Chryst, City Traffic Engineer, and will be presented at the organization meeting of the Lancaster Safety Council.

We congratulate both Philadelphia and Lancaster for their fine record, and sincerely hope that it is the pleasant duty of the section to repeat the presentation of this award again next year to both cities, as well as many more cities within our section boundaries.

The Mid-Atlantic Section can take pride in the sponsorship of the forthcoming Freeway Operations Seminar, October 6, 7, and 8, at the Holiday Motel, on Route 15, south of Harrisburg. The local arrangements committee has been very busy and is very pleased to report that as of press time, ninety-five reservations have been received. We fully expect to reach the top quota of 125 by opening date. Your local arrangements committee is as follows:

P. D. Muffley, *Chairman*
Richard Overmyer
Armand Keeley
Michael J. Gittens
Hartley C. Gafvert
J. V. Miller, *Food* (Pat Miller, *ex-officio*)
George Britton
Edward Gogolin

In addition to the committee, the following members will be assisting: In other words, they will be doing the work: Jake Baum, Robert Alexander, and Mrs. Bornman of Highway Planning.

WASHINGTON, D.C. SECTION

Charles Adler Jr., with his horn-actuated signal light at Falls Road and Belvedere Avenue, Baltimore, February 22, 1928.

METROPOLITAN (N.Y.) SECTION

The schedule of local section meetings for 1958-59 is as follows:

November 19, 1958 (Wednesday)—
New Jersey
December 17, 1958 (Wednesday)—
New York

(Continued on page 53)

The Section has reviewed the photograph reproduced above, showing Baltimore's working staff of Barnes, Rudden, Cleary, and Upham. The suggested title is: "Frankly Speaking — Who Works In Baltimore?"

The scene caught by the photographer in the picture to the left had its serious side too. Shown above are, L to R Henry A. Barnes, Baltimore Commissioner of Transit & Traffic; Charles Adler, Jr.; and Charles M. Upham, Jr., Deputy Commissioner, as a marker is attached to a new traffic signal controller cabinet at the site of inventor Adler's 1928 signal which was actuated by the sound of an automobile horn.

Reference Notes

OFF-CENTER LANE MOVEMENTS

A report of Technical Committee 3F of the Institute of Traffic Engineers, approved by the Technical Council and the Board of Direction for publication as an information report.

This report has been published in two sections. The first, published in the October issue of TRAFFIC ENGINEERING, was a survey of off-center reversible lane techniques as practiced in a number of jurisdictions around the country. This is the second section.

Because of the sparing use of the off-center, reversible lane principle and the therefore limited experience with such systems, tentative warrants can not be too stringently fixed. Further, in this era of extreme lack of roadway capacity, the warrants should be encouraging rather than discouraging.

The present situation in respect to the use of reversible traffic lanes is comparable to the use of traffic signal lights in the early part of this century. Had the present warrants for traffic signal installations been widely used at the inception of traffic signals, it can be reasonably presumed that traffic signals would still be a novelty in present day traffic controls; certainly the present day warrants, themselves, based as they are on years of experience with both success and failure, would be nonexistent. The introduction of any new traffic technique must, of necessity, be accompanied by a reasonable amount of experimentation, and such a complex technique as a reversible lane system with so many possible variables, should be accomplished by more than the usual amount of experimentation. One primary concern at present, is that no unreasonable barrier be placed in the way of wide-spread use of the reversible lane systems by warrants which are too stringent.

Of equal concern, however, is the need to prevent a hodge-podge of confusing systems from arising that might well have enough negative attributes to cancel all of the possible gains of such systems. Traffic Engineering is a much more precise study today than it was at the turn of the century, and the introduction of new traffic techniques should not be arbitrary and chaotic as has often been the case in the past. There is enough material in the limited experiences with reversible traffic lanes to provide some basis for sensible, practical warrants.

This then, is the guiding policy in the writing of these warrants—that the warrants minimize restrictions and therefore be conducive to the establishment of off-center, reversible lanes and yet, that they be sensible, practical and based on hard-won experience.

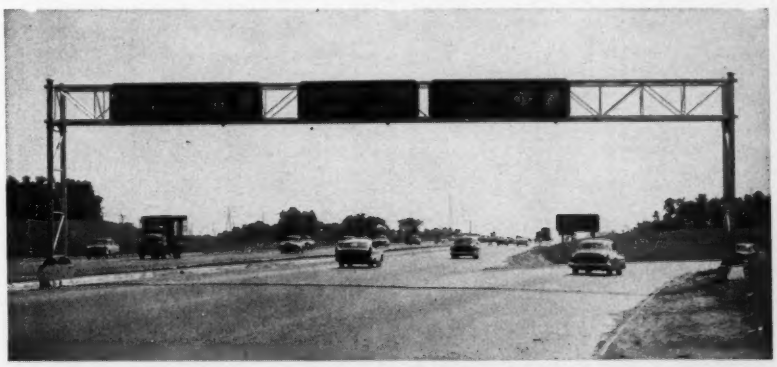
WARRANT I

Periodic Congestion

The basic thought of a reversible lane operation is to overcome periodic congestion, that is, the congestion that occurs for relatively short periods of the day for many if not all, of the days of the week. These periods are usually identified by the ironical term "rush hour" when traffic movement is at its slowest. The first consideration in establishing a need for reversible lane operation is the establishment of the fact of the existence of periodic congestion, a matter that is not nearly as obvious as it seems. Both of the elements of congestion and periodicity must be present.

a. congestion

Congestion as defined for the purpose of this study is simply the presence of supra-capacity traffic volumes for a substantial length of the roadway in question. This is quite different from just the presence of a great many cars on the roadway. In fact, in some cases it may involve rather small volumes. The main point is that the traffic



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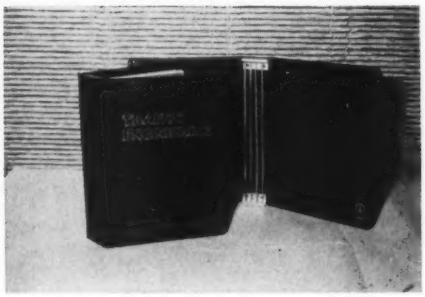

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volumes exceed the reasonable amount of traffic that can be accommodated on the roadway width that is provided. Such a condition can be determined by measured observation and/or calculation, but, in no case, should it merely be assumed to exist. The matter should be separately considered for each direction of travel on the roadway.

(1) Measured Observation

Mere observation is not traffic engineering. The casual motorist observes traffic in his everyday motoring and feels well qualified to recommend all sorts of traffic improvement plans. He feels confident that his glimpse of traffic patterns (of which he is not an impartial component) is irrefutable suport for his proposals, some of which may involve the expenditure of large sums of money or introduce suicidal maneuvers into traffic patterns. This is not to say that suggestions received from the public are necessarily silly or unworthy of attention, but that no traffic plan should be built on such a small amount of data.

Measured observations should include the taking of directional traffic counts, the accumulation of vehicular speed run tests to determine prevailing travelling speeds and the counting of back-ups and traffic signal cycle clearances at signalized intersections. Armed with such facts, the traffic engineer can not only plan improvements intelligently, but can accurately measure the results of any instituted remedial program. Congestion then would be revealed by—

(a) Aggravated slow-downs in traffic (speed trial runs that show reductions in speed of over 25% of normal expectations or of the design speed of the roadway).

(b) Aggravated back-ups at signalized intersections (counts that show that the great majority of vehicles miss one or more intervals completely).

(2) Calculations

Calculations are an invaluable aid in determining not only the scope of present day congestion but as a tool in forecasting future congestion either for existing roadways or for the planning of new roadways. Once a capacity for a specific roadway width has been calculated it is a simple matter to see where the capacity is exceeded, and congestion exists. Calculations of capacity can be obtained from:

(a) Charts, graphs, and tables as published by the Bureau of Public Roads. These yardsticks of capacity are relatively simple to use and cover a great many conditions.

(b) Capacity formulae. One excellent formula for calculating the capacity of any approach to a signalized intersection is

$$\text{Capacity} = \frac{3600\ N}{L}\left\{\frac{GT-5}{h}+1\right\}$$

where

N = number of available lanes
GT = green period of cycle in seconds
L = length of signal cycle in seconds
h = headway between vehicles in seconds (usually calculated at 2.4 seconds)

Whatever method is used to determine congestion, data must be collected previous to the institution of a reversible lane plan. The primary purpose of this is to factually establish the need for such a plan and secondarily, to obtain the necessary yardstick to evaluate the effect of the plan after establishment.

b. Periodicity

Of equal concern with congestion is the periodic fluctuation in traffic volumes. The essence of a reversible lane plan is to use one or more lanes of traffic reversibly during any fixed period of time. If the nature of the traffic flow is such that, although congestion exists, it does not appreciably diminish during the fixed period of time, then the use of a reversible lane is certainly not indicated; if a new assignment of lanes is to be used, then this should be done on a permanent basis.

Periodicity of congestion can only be determined by field studies encompassing periods of congestion and normal traffic flow. In typical urban situations this period of time is usually the 12 hour period from 7 A.M. to 7 P.M. The field studies should consist of either or both volume counts and speed trial runs.

WARRANT II

Physical Inventory

There are many factors which induce periodic congestion during the peak periods of the day. As traffic volumes approach these peaks, the facilities of the roadway tend to become swamped with the demand and the normal hour condition no longer will suffice to move traffic efficiently. This, then, is the situation that lends itself to the establishment of the off-center reversible lane plan.

However, there are many simpler considerations which might provide the needed capacity and forego the expense and more elaborate planning necessitated by reversible lane operations. These simpler measures should be considered first. They are:

a. Parking—If parking is allowed on the roadway in question, the exclusion of parking at the affected curb during the peak period often will suffice to overcome undue congestion.

b. Left Turns—Left turns which can be accommodated on a traffic facility during normal traffic volumes many times prove to be a serious impediment to traffic flow during peak hours. If left turns are permitted at critical intersections of the roadway in question, a periodic restriction of such turn may provide enough additional capacity to overcome the congestion.

c. Bus Movements—Bus loading zones improperly located or without adequate restriction of parking at critical intersections often can cause enough loss of capacity to induce unreasonable congestion. If this situation prevails on the roadway in question, judicious restriction of parking, throat widening, the transfer to a far side bus stop, or the consolidation of too-frequent bus stops, might provide enough capacity to overcome congestion.

d. Curb Loading—Commercial curb deliveries frequently reduce roadway capacity; the possibility of regulating or eliminating such deliveries should be considered.

e. Traffic Signal Changes—Traffic signal settings which are entirely sufficient for normal traffic flows often prove insufficient for peak hour volumes. A change in either or both the cycle length and the red-green split often will prove to provide the needed extra capacity.

f. Other Roadway Characteristics—Roadways frequently have traffic capacity-reducing characteristics that defy categorization. Such things as roadway alignments, pedestrian habits, lane markings or other more positive channelizations, often prove to be an impedance to peak hour volumes. A careful examination of such things is quite necessary to uncover other possible reasons for congestion.

WARRANT III

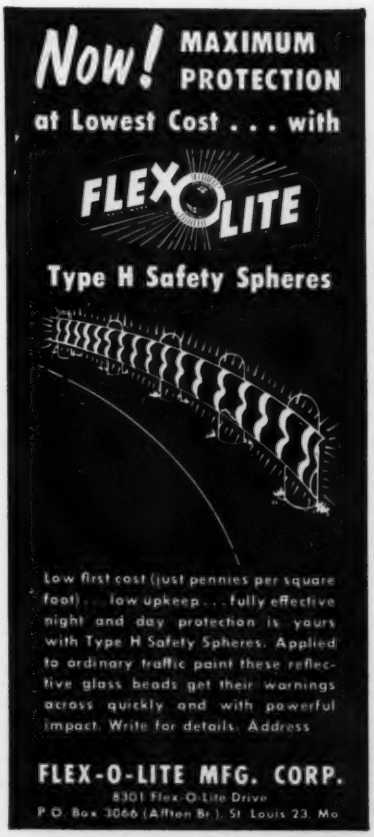
Ratio of Directional Traffic Volumes

Once the fact of periodic congestion has been determined and a physical inventory reveals that no further capacity increase can be obtained through changes outlined previously, a test for reversible lanes is in order. As is often the case of the periodic congestion during peak hours, it may be found that the supra-capacity volumes on the roadway are oriented in one direction of travel only, and that in the other direction of travel, sub-capacity volumes actually exist.

A simple test for sub-capacity volumes in the minor direction of travel can be obtained by applying the following ratio test to the rush hour traffic volumes—

Number of lanes needed for minor direction equals minor direction volumes times major direction volumes divided by number of lanes offered in the major direction

The result of such a test should be rounded up to the next integer and compared to the number of lanes of-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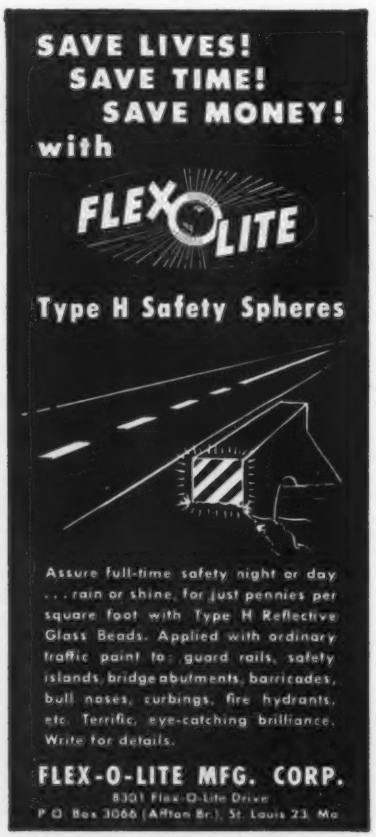
fered in the minor direction to determine the number of lanes available for a reversible operation. Such a test should be applied to many points on the roadway in question. The terms major and minor direction refer to the greater and lesser volumes on an evenly split street, and the average volumes per lane on unevenly split streets. Thus on a multi-lane a roadway split into an uneven lane arrangement, during some periods of the day the direction having the lesser number of lanes might well be carrying the greater average traffic volumes per lane and be considered the major direction of travel.

Another test for the availability of reversible lanes is based on capacity calculations. The number of lanes available for reversible operation equals

$$\frac{NC - V}{C}$$

where N equals the total number of lanes on the roadway, V equals the total, two directional hourly volumes, and C equals the calculated hourly capacity of one lane.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WARRANT IV

Access and Egress Considerations

Once the need for, and the availability of, reversible lanes has been established, careful consideration must be given to the availability of capacity at access and egress points of the reversible lane system. Additional volumes induced onto the roadway might swamp egress facilities and negate all of the gains of such a system, or on the other hand, limited access facilities might prevent the system from ever attaining its planned potential. A projected flow of traffic on the reversible lane system should be prepared to show the feasibility of the collection and dissipation of traffic. The need for such considerations should not be minimized because without them an aggravation, rather than an alleviation of traffic flows, might well be induced. Since the inception of any type of reversible lane plan involves a good deal of previous study, the outlay of what might be considerable monies, and a transition period of education and indoctrination to the public, the question of access and egress must be reasonably resolved before introducing such a system to the public.

WARRANT V

Systems of Control

The greatest amount of differentiation in reversible lane plans throughout the country has been in the systems of control used in establishing the off-center treatment. The wide divergence in the systems of control suggests that a good deal of latitude must be allowed in fitting reversible lane plans into local physical and economical situations. This, of course, leads to a lack of uniformity, but no over-all recommendations can be made for any one system over another on the basis of the experience to date. However, a great deal can be done to introduce uniformity within the various systems, themselves.

The three basic systems of controls that have been used are:

a. Physical Barriers
b. Lane Signal Lights
c. Informative Signs

Of course, these basic systems are far from mutually exclusive in all of their features, and, in fact, almost all systems use some components of the others. Each of the systems, however, differ not only in the amount of flexibility and control afforded, but also in the economics of their establishment and operation.

a. Physical Barriers

The use of physical barriers in establishing reversible lanes ranges from permanent installations, through temporary barriers, and to merely painted lane lines.

Examples of permanent installations are the capacity providing fins as used by the Chicago Park District or the mountable curbs as used in New York City. Both of these systems involve a rather large initial expense, some use of such temporary barriers as cones and barricades, and a daily labor maintenance cost. Although they differ in degree in these respects and also in the amount of flexibility afforded, they both offer, again in a varying degree, the most positive barrier to opposing streams of traffic.

The more common use of physical barriers is the utilization of traffic cones, barricades and sign pedestals as temporary measures of establishing the provisional center line. The use of such movable barriers reduces the initial expense and increases the daily labor maintenance costs. The temporary barriers offer a much less positive separator to opposing streams of traffic both because of their mobility and because of the rather wide dispersion of these segregating devices.

In the instance of using temporary barriers, there should be two elements of uniformity regardless of the difference in the devices used. These two elements are the use of a specially designated provisional off-center lane line and the placing of the segregating devices so that at least one is in view at all times to the entering and moving traffic.

At present, the provisional center lines are designated by variations in width, striping, color, or by combinations of these methods; the standardization of this practice should be resolved by special committee action.

b. Lane Signal Lights

A deservedly popular scheme for establishing reversible lane plans is the use of overhead signal lights to indicate the direction of usage of traffic lanes. Although such a system offers no physical barrier to opposing streams of traffic (and experience shows that violations of the median line is not infrequent) no adverse ac-

cident experience has been reported to date. The appeal of such a system is the simplicity of its operation. The lane signal lights can be operated by a time clock, or manually, or both, and fundamentally, no daily labor maintenance of the reversible system is involved. This is in contrast to the high initial expense of erecting the signal lights.

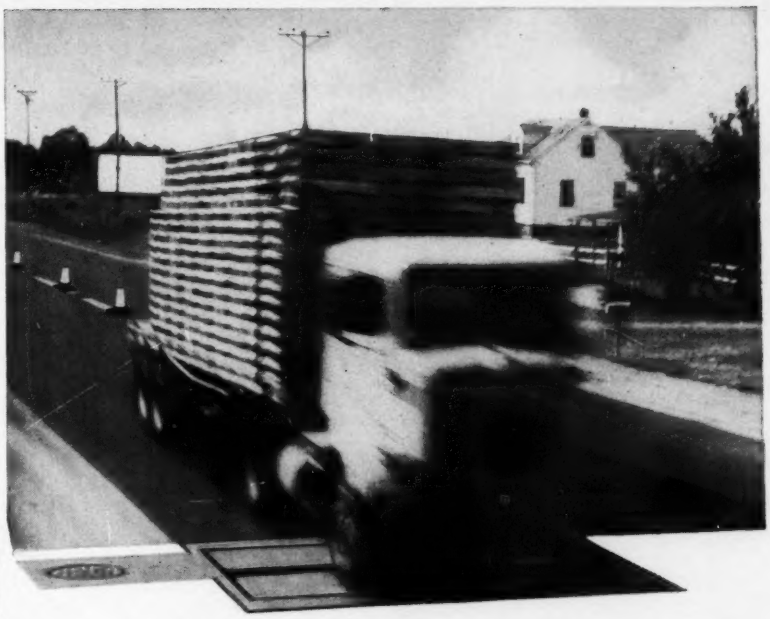
The uses of lane signal lights vary in many degrees, but the one fundamental demand for such a system is that the lane signals be suspended directly above the lanes involved. This has been accomplished by incorporating special lenses at overhead signallized intersections or by the erection of special signals at intermediate points. The lane indication signals have been used over the entire width of the roadway in some instances and in other instances the use of the lane signals has been confined to only the specific lanes that are reversed. No fundamental objections have been raised locally to any of these variations. However, in any lane signal system there are elements of uniformity that should be observed. They are:

(1) The roadway must be completely lane lined.

(2) The lane indication signals must differ from conventional stop and go signals. The specific details of the lane signals should be established by separate committee action. It is recommended, however, that the lane usage signals use a downward pointing arrow on a red lens to indicate the prohibition of lane use and an upward pointing arrow on a green lens to indicate permission of lane use. In present usage, companion red and green lenses used for lane indication lie in either horizontal or vertical planes with the red lens to the left or above the green, respectively. It is further recommended that future installations be confined to having the lenses on a horizontal plane; this restriction would differentiate lane signals from the conventional intersectional signal installations.

(3) At least one signal indication must be in view at all times both to entering and moving traffic.

(4) The transition of lanes should be accomplished by a full red indication to both directions or by the alternate flashing of the red and



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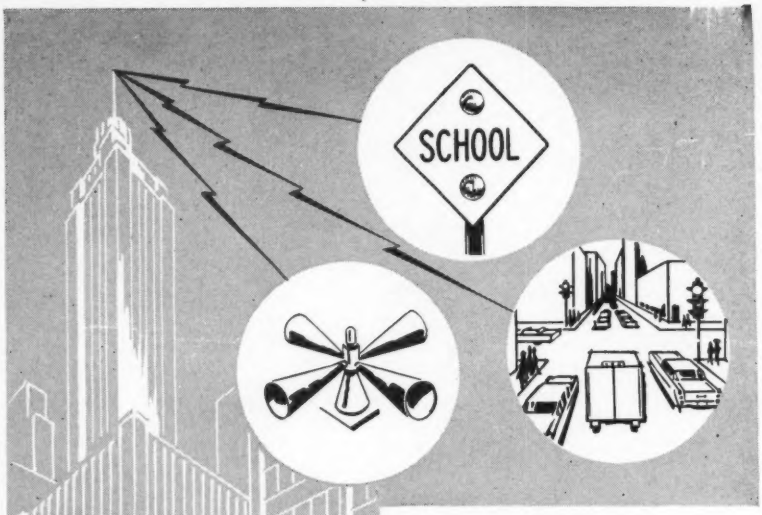

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green signals for a long enough interval to insure clearance of the lane or lanes to be reversed.

c. Informative Signs

At least in one instance, in Cleveland, Ohio, the transition of reversible lanes is accomplished by merely a permanent display of signs along the margin of the roadway. Although such a system provides no physical barrier to opposing streams of traffic and no immediate identification of lane usage, the authorities report a successful operation of this plan. Should such a plan be deemed as adaptable to any community, certain elements should be present. These are:

(1) The roadway in question should be one that is fundamentally traversed by purely local traffic so that a strong familiarity with the system would be quickly established.

(2) A color code be adopted for both the informative signs and the lane markings to distinguish them from conventional use.

(3) Strict police enforcement be used in the transition period.

Addenda

In the theory of off-center reversible lane operations there are certain premises which are based on logical considerations, but which have not been followed in all instances. One such premise is that in the operation of a reversible lane plan no fewer than two lanes be used for the minor direction of travel. This premise is based on the fact that any movement confined to one lane can be completely paralyzed by a traffic accident or a stalled vehicle in that lane; further, in communities which experience snowfall during the winter months, snow embankment at the curb could again seriously restrict traffic movement in the curb lane. The usual outcome of such conditions is that the minor direction traffic will violate the provisional center line; this, of course, is an invitation to medial accidents, which normally produce the most severe results of any type of vehicular accidents. Traffic movements confined to one lane also normally preclude the feasibility of left turns and bus loadings in that lane.

While these objections to off-center, reversible lane use on three and four lane roadways do exist, the fact that there have been very sucessful operations of this type in specific instances, where right-of-way and economic limi-

tations have prevented roadway widenings, indicates that such operations should not be excluded from all consideration. Some of these operations on three and four lane roadways have rendered valuable and lengthy service in overcoming capacity demands where all other traffic engineering recourses have failed.

Although successful off-center reversible lane plans have been introduced on three and four lane roadways, serious consideration must be given to the restriction of traffic movement to one lane, Since such a plan actually forces a violation of the median at times, at least three elements in the traffic characteristics of the roadway must be ascertained before the establishment of such a system. They are:

(1) The traffic on the roadway in question be of a purely local character, so that a strong familiarization with the system is quickly attained,

(2) The prevailing speeds on the roadway be relatively low,

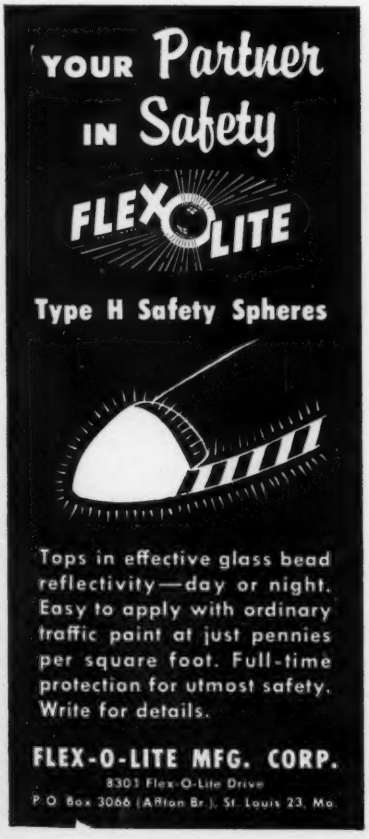
(3) The density of the traffic be relatively low. (This is often the case where the dominant capacity restrictions occur at some signalized intersections and the intervening lengths of the roadway can easily accommodate the traffic volumes.)

Further, left turns and bus loadings must be prohibited in the one lane provided for the counter direction of travel.

Another premise of reversible lane operations is the thought that the higher the speed on a roadway, the greater the need for a positive barrier to opposing streams of traffic. This is certainly true even for conventionally operated roadways. However, there have been examples where fairly high speed roadways have been operated without physical barriers with acceptable success. This again is a matter that requires serious consideration in the planning stage. Likewise, the matter of lane widths is of considerable importance to successful reversible lane operation, especially where no physical barriers are provided on high speed roadways. The design width of such lanes is twelve feet, but again instances can be cited of the successful use of narrower lanes.

In the planning of a reversible lane system, the one overshadowing influence often is economic. Not everyone can afford to have the best possible system and in almost all cases, some compromises must be made. The economics of the situation not only dictate the form that reversible lane plans take, but also shape the degree of conformity with the warrants and basic premises covered in this study.

If the establishment of a reversible lane system calls for a very large expenditure of monies, then the system must, as a justification for the money spent, coincide precisely with the warrants and basic premises of this study. On the other hand, if a reversible lane scheme is to be used which does not involve large expenditures, then some liberties can be taken with some points of these warrants. This is because a low budget scheme can be considered somewhat as an experiment and can be altered or even abandoned without too great a loss in either money or prestige to the traffic planner; and expensive and extensive systems must be contrariwise, substantially assured of success before installation.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Reference Notes

Solving Urban Transportation Problems

The program of the National Committee on Urban Transportation for solving urban transportation problems is contained in a Guide Manual, *Better Transportation for Your City*, and an initial series of 15 procedure manuals, all recently published by Public Administration Service. The work of the National Committee, resulting in these publications, enlisted the talents and experience of 175 leading experts in transportation and related fields.

The Guide Manual is a handbook designed to help mayors, city managers, councilmen, transit officials, and representatives of state and county governments in the factual development of over-all transportation plans.

The procedure manuals are designed for use by technical or field personnel in carrying out the specific studies recommended in the Guide Manual and in interpreting the data collected. The data developed in one study are frequently necessary to another; thus, the information resulting from individual studies has reciprocal values, eliminating the need for special or overlapping studies and providing for efficiency in terms of effort and cost.

The general content of each of these publications is described briefly as follows.

Guide Manual

Better Transportation for Your City outlines step by step how cities and metropolitan areas may develop practical over-all plans aimed at balanced improvement of all forms of local transport, in keeping with desirable goals of urban renewal and healthy suburban development. 112 pp., cloth, indexed, illustrated. $5.00.

Procedure Manuals

1A. *Determining Street Use* describes a procedure for grouping streets into logical systems according to present use. As the first study to be made, this grouping serves as a blueprint for undertaking the fact-finding studies described in Stage II of the *Guide*, including Traffic Service (3A, 3B, 3C, 3D and 3E), Street Inventory (5A), Financial Records and Reports (6A), Transit Service (4A),

and others. Street-use categories and a control section numbering system provide a simple way to interrelate the findings of these studies.
13 pp., illustrated. $1.00.

2A. *Origin-Destination and Land Use* outlines the purposes and objectives of an origin-destination survey and its importance in terms of existing and future land use. It presents the methods of conducting different types of O-D surveys in cities of various sizes. Also presented are the technical procedures required and the methods of estimating future travel desires, including the application of land-use data.
52 pp., illustrated. $2.00.

2B. *Conducting A Home Interview Origin-Destination Survey* presents detailed methods for collecting all basic facts on present travel, by mode, purpose, origin-destination, and time of day, for all trips made on a typical day within a city or metropolitan area. The major sections of this manual are: collection of field data; evaluation of survey accuracy: coding, punching, and computation of expansion factors; and tabulations. In general, this type of survey is not conducted in cities and metropolitan areas of less than 50,000 population. The use and application of more limited studies are presented in Manual 2A. Manual 2B was prepared by the Bureau of Public Roads and made available to the National Committee for use in this series.
116 pp., illustrated. $2.50.

3A. *Measuring Traffic Volumes* describes a series of systematic studies designed to provide a city with the minimum necessary volume data on the traffic that uses its existing street system. The studies recommended include control counts, coverage counts of major and minor street systems, cordon counts around the central traffic district, and counts at selected screen lines. Alternative methods using both machine and manual techniques are also explained. Volume information is essential in determining the extent and nature of a city's transportation problem and is helpful in establishing design criteria and project priorities in the ultimate improvement program.
48 pp., illustrated. $2.00.

3B. *Determining Travel Time* outlines the procedure for determining peak-hour travel time on the major street system. Data are developed by a series of timing runs on the street system. This information, when combined with the traffic volume data described in Manual 3A, provides a measure of existing traffic service which can be compared with the standards presented in Manual 7A to determine street deficiencies.
24 pp., illustrated. $1.50.

3C. *Conducting A Limited Parking Study* describes the studies required to obtain minimum essential information on parking conditions in a city. These studies measure parking supply, use and duration, and parking meter revenue. They should be carried out on a continuous program basis in order to reveal significant trends.
44 pp., illustrated. $2.00.

3D. *Conducting A Comprehensive Parking Study* describes an optional supplement to the procedure outlined in Manual 3C that may be used by cities desiring detailed information on parking demand by location. These facts on parking demand are used in determining precise areas of parking deficiency, selecting parking facility sites, and appraising their financial feasibility. This manual was prepared by the Bureau of Public Roads and made available to the National Committee for use in this series.
172 pp., illustrated. $2.50.

3E. *Maintaining Accident Records* sets forth a method of maintaining accident records and a study procedure that utilizes this information to help define the level of traffic service provided. The end product is a summary of accident rates — city-wide, by street class, and by individual control section. It also describes the minimum information necessary and how to maintain accident files.
24 pp., illustrated. $1.50.

4A. *Measuring Transit Service* discusses methods for the measurement of existing transit service in terms of routes and coverage, passenger loading, frequency and regulation of service, running (travel) time, and speed and delays. The objective is to provide information and procedures for measuring and controlling the existing level of transit services so they may be operated on an efficient and economically sound basis. This information also provides guidance for public and transit officials in integrating transit operations with over-all community transportation policies, plans, and programs.
36 pp., illustrated. $1.50.

5A. *Inventory of the Physical Street System* outlines procedures for assembling information on the extent and physical condition of the street system, including type and condition of surface, structures, street lighting, operational controls, roadway widths, drainage facilities, and utilities occupying street right of way. An inventory of this type provides a community with a listing of its present assets in streets, which is indispensable for developing a sound improvement and maintenance program.
28 pp., illustrated. $1.50.

6A. *Financial Records and Reports* details the accounting system necessary to provide adequate data for the financial management of urban transportation facilities. A system of financial records and reports is valuable in the development of an over-all transportation improvement program, including operation and maintenance as well as new construction. Summary report forms are provided for use both by legislative and by administrative officials.
112 pp., illustrated. $2.50.

7A. *Standards for Street Facilities and Services* presents basic considerations in reviewing the classification of streets and suggests appropriate service and geometric criteria in each class of street. The standards developed can be used to guide in the maintenance and operation of the street system and the planning and construction of improvements.
36 pp., illustrated. $2.00.

8A. *Recommended Standards, Warrants, and Objectives for Transit Services and Facilities* presents standards for transit routing, loading, frequency and regularity of service, frequency of stops, speeds, inauguration of special services, and the objectives related to such standards.

The information collected through Manual 4A will provide the basis for measuring the level of existing service and will help in formulating standards that reflect local needs and conditions. Also discussed are warrants for extension of service into new areas, warrants for the abandonment or curtailment of service, as well as the use of freeways for transit.
27 pp. $1.50.

11A. *Improving Transportation Administration* outlines some of the methods that may be used to conduct an administrative survey for the purpose of improving organizational structure and procedures related to the planning, construction, operation, and maintenance of transportation facilities. Also discussed are ways to encourage better working relations between local units of government on an areawide basis, and between local, state, and federal agencies in this field.
28 pp. $1.50.

12A. *Modernizing Laws and Ordinances* brings together all necessary legal tools to help cities measure the adequacy of present laws relating to urban transportation. This inventory is an important step toward the development of sound over-all improvement programs. The manual is arranged so that it may be utilized as a work book in carrying out the study.
128 pp., indexed, references. $2.50.

The National Committee on Urban Transportation, with Headquarters at 1346 Connecticut Avenue, N.W., Washington, D.C., consists of representatives of the American Municipal Association, the American Public Works Association, the American Society of Planning Officials, the Canadian Federation of Mayors and Municipalities, the International City Managers' Association, the Municipal Finance Officers Association, the National Association of County Officials, the National Institute of Municipal Law Officers, and the U.S. Bureau of Public Roads.

The Guide Manual and the 15 procedure manuals may be ordered from Public Administration Service, 1313 East 60th Street, Chicago 37, Illinois. Prices of individual publications are listed above. A special price of $25.00 has been established for the set of 15 manuals.

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Reference Notes

PANIC STOPS TEST TIRES FOR STOPPING ABILITY

For a long time it has been commonly assumed that all tires have relatively the same stopping ability on a clean, dry, level road surface when the brakes of the vehicle are locked to produce a skid. On this basis it has also been assumed that the initial speed of a vehicle, prior to skidding, can be determined by establishing the coefficient of sliding friction, measuring the skid marks and using the formula:

$$\text{Length of skid marks} = \frac{V^2 \text{ (V-velocity)}}{30\ F \text{ (F-friction coefficient)}}$$

Thus to find velocity or speed of the vehicle prior to skidding the formula is:

$V^2 =$ Length of skid marks x 30 F

There has been little recent experimental testing involving locked wheel stops on dry pavements to confirm this formula.

To supply more data and to determine whether even more research in this area is needed, the M.S.U. Highway Traffic Safety Center undertook a pilot study of locked wheel skid performance of various tires on clean, dry road surfaces.

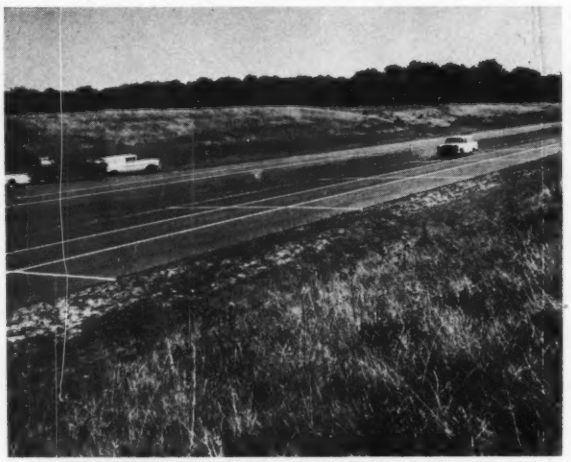
Under the direction of Dr. Samuel Mercer, Jr., associate professor in the University's applied mechanics department, the research project was conducted with the cooperation of the General Motors Proving Grounds at Milford, Michigan.

Assisting Center staff members in conducting the tests were General Motors Proving Grounds personnel under the direction of Paul C. Skeels, in charge of the experimental engineering department.

Representatives of the National Safety Council and the U.S. Bureau of Public Roads aided in the planning as well as testing phases of the project.

Four tire companies: Goodyear, Goodrich, Firestone and U. S. Rubber supplied the tires and also representatives to act as observers.

Each company provided 12 tires and 4 wheels. Tires were one hundred level, size 6.70 x 15, synthetic compound, blackwall, tubeless and were selected at random from warehouse stocks. All tires were run a minimum of 200 miles under normal operating conditions before tests were started.



$V^2 = 42\ (30)\ .715$
Estimated speed:
30 miles per hour

Observed speed: 30 miles per hour
Length of skid marks: 42 feet
Friction coefficient: .715 (average of four tests)

$V^2 = 114.9\ (30)\ .715$
Estimated speed:
49.6 miles per hour

Observed speed: 50.4 miles per hour
Length of skid marks: 114.9 feet
Friction coefficient: .715

Three different road surfaces were used for the tests. First was a straight, level, bituminous asphalt surface; the second was a level, concrete surface and the third was a section of U.S. Route 16, near Brighton, Michigan, a heavily used bituminous asphalt highway.

Panic stop tests were performed at 30, 40, 50 and 70 miles per hour. (A panic stop is obtained when the driver applies the brakes with such force as to lock the wheels quickly.)

Vehicles used were a 1956 Chevrolet station wagon and a 1956 Chevrolet four-door sedan. The sedan was also sandbagged to produce a heavier wheel loading (equivalent to the Pontiac class).

In addition to panic stop tests, tires were dragged in pairs mounted on a special dynamometer developed recently by General Motors' engineers to measure road friction.

This material first appeared in the MSU Center Letter, published by the Highway Traffic Safety Center, Michigan State University. It is based on work reported at the 37th Annual Meeting of the Highway Research Board in a paper entitled "Locked Wheel Skid Performance of Various Tires on Clean, Dry Road Surfaces," by Samuel Mercer, Jr., of Michigan State University.

$V^2 = 212.6\ (30)\ .715$
Estimated speed:
67.5 miles per hour

Observed speed: 69.8 miles per hour
Length of skid marks: 212.6 feet
Friction coefficient: .715

The ability to stop on a clean, dry, level road surface is essentially dependent on speed, vehicle characteristics, road surface type and tire characteristics. In this study, skidding speed and tire characteristics were found to be the most influential factors.

Results of the study indicated that while there were variations in the stopping ability of tires of different makers, and to a lesser degree among tires of the same make, these variations were relatively small. The greatest difference amounted to approximately 10 per cent at the 70 mile per hour speed. Differences were less at slower speeds.

Of most significance was the consistency for friction coefficients to increase slightly as the speed of skidding increased.

This is at variance with most other published material on the subject. It indicates that a tire's stopping efficiency improves slightly as the skidding speed increases, but before any further interpretations are made, additional research should be accomplished.

The effect of load on stopping ability was also measured. It was found that stopping ability decreases slightly as the load increases.

Despite the many factors which may have some effect on the distance a vehicle will skid to a stop on clean, dry pavement, the recommended method of estimating speeds in accident investigations through use of the speed squared formula was found reliable.

Under carefully controlled conditions, using the same tires, vehicle and road surface, such estimates are within 5 per cent of the true speed. Even where different makes of tires are involved on the test vehicle (assuming that the accident-vehicle is not available) and such tires are of comparable condition and quality, estimated speeds will be within 10 per cent of actual speed.

The study showed that such speed estimates are predominantly conservative.

For example, speed estimates were made with the speed squared formula based on the average friction coefficient of 4 stops at 30 miles per hour for each set of tires of the same make. When these speed estimates, based on the average friction coefficient were compared with actual speed (40, 50 and 70 mph tests) the estimates were found to be in error a maximum of +0.7 and —3.5 miles per hour. Estimates were predominately lower than the actual car speed.

When speed estimates were made with the speed squared formula based on the average of the lowest coefficients of friction (obtained on the 30 mph stops for all tires) and then on the average of the highest coefficients (30 mph stops) the variation between estimated speed and actual speed at 70 mph was found to be +0.2 to —5.6 miles per hour.

This would be comparable to making speed estimates based on a drag factor established by comparable tires, rather than those on the accident-vehicle.

Again in the majority of cases, the estimated speed was lower than the actual speed.

Such conservative consistency in determining speed by the speed squared formula occurs because tires tend to develop more tractive effort when skidding at higher speeds than at lower speeds. When friction coefficients are determined with tests at lower speeds and then applied to typical accident investigation problems, it generally produces speed estimates lower than actual speed because of this increase in tractive effort.

Revised Edition of NHUC's 'The Right Word' Now Available

A revised edition of "The Right Word," a glossary of highway terms, has been published by the National Highway Users Conference.

Requests for the original edition of the handy reference booklet were so heavy that the supply was exhausted. The current edition contains additional definitions which have come into recent use as a result of fast-moving highway developments.

In a forward to the new edition, Arthur C. Butler, NHUC Director, states: "Just as scientific advances have increased and changed the average man's vocabulary, so the tremendous development of the nation's highway systems is bringing with it new words, new meanings, and more general significance to many technical terms."

He added that since "The Right Word" was first published two years ago, "events and word usages have been moving rapidly." The decision to revise and reissue the publication, he said, is part of NHUC's continuing effort to encourage public understanding and interest in highway development.

Free single copies and prices for quantity orders may be obtained from the National Highway Users Conference, 966 National Press Building, Washington 4, D. C.

SECTION NEWS

(Continued from page 42)

January 21, 1959 (Wednesday)—New York
February 25, 1959 (Wednesday)—New Jersey
March 31, 1959 (Tuesday)—New York
May 9, 1959 (Saturday)—Ladies' Night—New York
June 3, 1959 (Wednesday)—New York

Out of towners are cordially invited. For exact place and time, contact: Warren Travers, Sec.-Treas., Metropolitan Section, % Edwards and Kelcey, 3 William St., Newark 2, N. J.; or telephone him at MArket 3-1804.

Reference Notes

FIRST INTERSTATE SIGNS

By Robert A. Burch
(Mem., ITE)
Traffic Engineer, North Carolina Highway Dept.
Raleigh

North Carolina recently opened two sections of the Interstate Highway System to traffic where signs had been placed in exact accordance with the new manual issued by the American Association of State Highway Officials. In order to present a reason for discussion and to establish the record, this is to say that this is the first section of the Interstate System where signs have been placed in strict accordance with the new manual.

One section is 17 miles in length at the most eastern end of Interstate 40 lying between Greensboro and Winston-Salem. This section has 10 interchanges and no service roads.

The other section is locally termed as the Charlotte Bypass and is a section of Interstate 85, 12 miles in length with 9 interchanges.

All of the best known features were built into these signs and the original cost was not spared with the intent that the best possible installation would be provided in order to eliminate maintenance in future years. The signs were built of multiple sheets of 0.125 aluminum and were provided with a reflectorized background. The message was accomplished by the use of reflectorized demountable letters. The aluminum sheets were hung on aluminum frames, and provided a smooth surface face.

Tapered aluminum poles were employed for support of these aluminum signs and these poles were each fastened with four anchor bolts set in concrete. All hardware, nuts, screws, bolts, etc. were either aluminum or stainless steel. The hardware requiring resistance to strain was of stainless steel such as the "U" bolt clasp placed around the tapered aluminum pole for supporting the sign frame.

The overhead sign support structures placed at the beginning of the off-ramps were made of aluminum. They are of the square box truss aluminum type.

All of the signs, sign supports, necessary framing, and hardware were purchased on a low bid basis. Erection was by State forces. Due to the fact that no special crew was organized for the erection the regular sign erectors and the centerline striping crew were used in this work. They were called upon for a great deal of ingenuity and experimentation in the erection. Due to the fact that they had never placed signs of this type, they devised many different methods of doing it. These included the use of cranes, hydraulic ladders, tubular staging, and other gadgets.

The cost of erecting each of the two jobs was in excess of $15,000. A major portion of this cost is attributed to the fact that approximately 100 cubic yards of concrete was required for the foundation of the five overhead bridges and an equal amount of concrete was needed for foundation of the tapered aluminum poles. The purchase price of signs for the 17-mile section and the 12-mile section was $127,000. and $91,000. respectively.

Viewing these signs in place will very likely reduce the criticism anyone may have had of the requirements of the new manual. When the new manual was first released there was considerable criticism of some of its requirements, and especially in regard to the square footage required for the signs. The general appearance of the signs is excellent and they are legible both night and day for an adequate distance. The general æsthetics of the signs materially add to the comfort of driving. Little trouble was experienced in carrying out the intent and principles of the manual; however, due to the close spacing of and the short distance between interchanges it was necessary to classify some of them as minor exits not needing the two-mile and one-mile advance information.

Our experience with these signs causes us to have only one important criticism of the manual. We feel that whenever an overhead structure is placed at an exit the duplicated information placed at the beginning of the deceleration lane is not needed. If the alignment of the road has a curve to the right at the exit point, or immediately in advance of it, this sign shown as Figure #9 in the manual blanks out part of the overhead structure and frequently sweeps across the three signs mounted on the overhead. Other points still controversial are whether the entire length of road needs delineation and also whether a short skip shoulder line would not serve as well as a continuous line.

MEMBERSHIP APPLICATIONS

(Continued from page 40)

CEBALLOS, Guillermo G.
Civil Engineer, Planning Division, Ministry of Public Works, Ministerio De Obras Publicas, Havana, Cuba. September 30, 1958 for JUNIOR grade.

COX, Donald J.
Assistant Highway Engineer, Washington State Highway Department, Transportation Building, Olympia, Washington. September 26, 1958 for JUNIOR grade.

CRAWFORD, George L., Jr.
Traffic Field Engineer, Illinois Division of Highways, 9300 East St. Clair Avenue, East St. Louis, Illinois. September 10, 1958 for ASSOCIATE grade.

CUNNINGHAM, Stuart A.
Assistant Traffic Engineer, Delaware State Highway Department, New & Water Streets, Dover, Delaware. September 16, 1958 for ASSOCIATE grade.

D'ADDABBO, Frank M., Sr.
Design Engineer, Traffic, Connecticut Highway Department, 165 Capitol Avenue, Hartford, Connecticut. September 15, 1958 for ASSOCIATE grate.

DUNWIDDIE, Bruce R.
Senior Highway Designer, Missouri State Highway Commission, Highway Building, Jefferson City, Missouri. September 26, 1958 for ASSOCIATE grade.

EVERHART, Howard B.
Senior Engineer, Missouri State Highway Commission, Highway Building, Jefferson City, Missouri. September 24, 1958 for ASSOCIATE grade.

FARMER, Justin F.
Traffic & Planning Engineer, Porter, Urquhart, McCreary & O'Brien, 1140 Howard Street, San Francisco, California. October 10, 1958 for JUNIOR grade.

HEGLUND, Carl T.
Assistant Traffic Control Engineer, Wisconsin State Highway Commission, State Office Building, Madison 2, Wisconsin. September 29, 1958 for JUNIOR grade.

HOFFMAN, Harvey T.
Traffic Field Engineer, Illinois Division of Highways, 9300 St. Clair Avenue, East St. Louis, Illinois. September 10, 1958 for ASSOCIATE grade.

HOOPER, Paul C.
Assistant Highway Engineer, Washington State Highway Department, Transportation Building, Olympia, Washington. September 29, 1958 for JUNIOR grade.

KOLOM, Lester L.
Traffic Engineer IV, Bureau of Street Traffic, Room 709, City Hall, Chicago 2, Illinois. October 10, 1958 for ASSOCIATE grade.

LACY, Joe M.
Planning & Traffic Director, City, P. O. Box 178, Englewood, Colorado. October 6, 1958 for JUNIOR grade.

MARSHALL, George R.
Assistant Civil Engineer, Department of Traffic, 100 Gold Street, New York 38, New York. September 5, 1958 for JUNIOR grade.

MAY, John F.
Civil Engineer III, Illinois Division of Highways, 6035 North Mt. Hawley Road, Peoria, Illinois. September 29, 1958 for JUNIOR grade.

NELSON, Richard C.
Traffic Control Engineer (1), Division of Traffic Engineering, City, 417 Lincoln Park Drive, Cincinnati 3, Ohio. September 11, 1958 for ASSOCIATE grade.

PELLEGRINI, Giorgio
Assistente Straordinario, Department of Highways Construction of the University of Rome, via Eudossiana 18, Rome, Italy. September 11, 1958 for JUNIOR grade.

ROTMAN, Morris
Traffic Analysis Supervisor, Toronto Department of Public Works, 129 Adelaide Street West, Toronto, Ontario, Canada. October 1, 1958 for JUNIOR grade.

SADAI, Yoshiaki
Section-Chief of Road Planning Section, Japanese Ministry of Construction, Matsushima-cho, Takamatsu-shi, Japan. September 25, 1958 for ASSOCIATE grade.

SCHUBERT, Sydney
Engineer I, Main Roads Department, Box 1412T, G. P. O., Brisbane, Queensland, Australia. October 1, 1958 for JUNIOR grade.

SQUIRES, David L.
Roadway Design Engineer I, N. C. State Highway Commission, Raleigh, North Carolina. October 2, 1958 for JUNIOR grade.

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Fourth International Study Week in Traffic Engineering

Reported by David K. Witheford
Planning Engineer
Delaware Highway Dept.

The Fourth International Study Week in Traffic Engineering was recently concluded in Copenhagen, Denmark. The meeting jointly sponsored by the World Touring and Automobile Organisation, the Permanent International Association of Road Congresses, and the International Road Federation, was one of several held during the past few years to promote the wide employment of sound traffic engineering techniques.

Attendance at the weeklong conference was well over 600, and representatives were present from at least 37 countries in all parts of the world, including several nations behind the Iron Curtain. Engineers of the European Countries were naturally present in the greatest numbers, notably, the Scandinavian Nations, France, Germany, and Great Britain.

Conference Procedure

The world-wide representation of delegates to such a conference naturally posed problems of language barriers and so on. These were effectively overcome by the sponsoring organizations. First of all reports prepared for the meeting and other conference documents were distributed to delegates prior to the sessions in a choice of English, French, and German. During the sessions, a speaker could be heard directly in the auditorium, or through earphones in immediate translation. Each talk was simultaneously translated into English, French and German, and delegates could switch to the language of their preference at will. This of course was similar to the procedure used at the United Nations in New York, and solved the language problem very neatly throughout the conference.

The normal procedure during the sessions was to have a presiding chairman, and a general reporter who summarized and commented on the reports prepared for the subject under discussion. These reporters were distinguished European engineers who could speak with authority on their subjects. Following the general reports, members of the audience were invited to ask questions and discuss the papers. Questions were frequently answered by the authors themselves, by the general reporter, or by other delegates to the meeting. Needless to say, some lively discussions took place on such controversial subjects as the unique parking problem solution recently initiated in Paris.

The advance distribution of the papers had, I feel, a great deal to do with stimulating the discussions. Not only was it possible to spend greater time on discussion, but the discussions were more fruitful and more widely participated in than those at most of our conferences.

Subjects of the Conference

After the initial meeting at which King Frederick IX of Denmark officially opened the conference, six sessions on different subjects were established. These included:

1. Traffic Analysis
2. Regulations for Streets and Highways
3. Freeways
4. Urban Streets
5. Accident Studies
6. Parking

It is impossible to cover all the items discussed and give due credit to all those participating in the conference, but a brief summary of items should be indicated. Traffic analysis—included reports on counting equipment and techniques, a report on the Chicago Area Transportation Study by Creighton, and reports on various European O & D Studies. Regulations—reports on effects of two-wheel vehicles, reports on signs, marking and signals, which promoted considerable discussion. Freeways — reports on needs justification, importance of relation to town planning, and freeway signs and markings. Urban Streets—intersection capacity studies, value of tunnels and underpasses, and pedestrian regulations, which developed some pros and cons on the use of the "scramble" system. Accident Studies—reports on seasonal variations, rates according to time of day, and of particular interest to Europeans, relation to motorcycle, bicycle and pedestrian traffic. Parking —discussion of Paris disc system, employment of parking meters, parking garage financing, design, and operation.

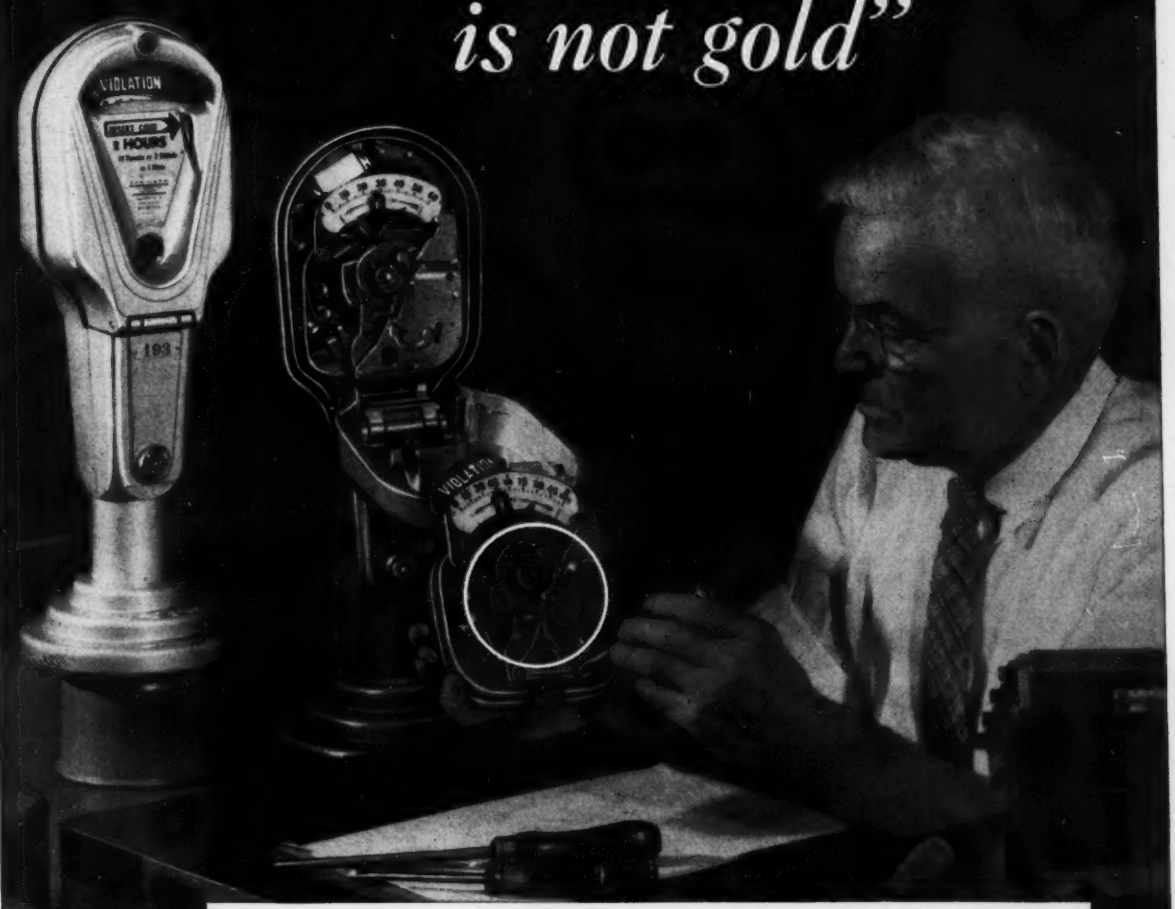
It is evident from this brief listing that European traffic engineers are largely concerned with the same problems we are, and are looking for answers to the same questions. While it is true that traffic volumes are generally not as high, many areas in Europe are experiencing increases at the rate of 12 per cent or more per year. This causes considerable concern, especially in urban locations where it is often extremely difficult to modify street layouts which originated five or more centuries ago. Not only are urban problems similar. There is a growing public awareness for the need of improved rural roads, and the freeway concept is being spread. Consequently, highway engineers are experiencing the problems of route selection and justification, geometrics, and operational signs and markings. The traffic engineer is becoming more and more important in the total highway picture.

Summary

The equal concern with the same type of problems was what struck me the most during the conference. It was equally interesting, however, to note the different approaches often being developed to problems in traffic research. The European engineers appear to follow our research and publications quite closely, and it is felt that we in turn could benefit from a greater study of the work that is being done over there, if there were some way it could be made more available.

In any event, it appears that both sides of the Atlantic would benefit from a greater interchange of ideas and experience. Conferences such as the Study Week would probably welcome greater participation by American Traffic Engineers, because we have encountered and solved, at least to some extent, some of the problems which are facing European Traffic Engineers. Our participation in the meetings would also contribute to throwing fresh light on problems which are constantly arising in the U. S. A. There is no doubt that mutual benefits would come about.

"All that glitters is not gold"



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Letter to the Editor

September 21, 1958

Dear Sir:

The Fourth International Study Week on Traffic Engineering was concluded yesterday. Since I am not coming back for another month I thought I would drop you a note about the meeting, and give you a longer report when I get home.

The meeting was really worth while and I personally got a lot out of it, as did the others who were attending. But the thing that impressed me most was the universality of the traffic problem. No matter where you go the people are trying to cope with the problem—and even the details are the same —in Denmark, Italy, Poland, Ghana, Japan or California.

Several members of the ITE were present including the three of us from U. S. A. (Bruce Murray and David Witheford) and also J. A. Fraenkel from Israel, W. O. Backhouse from South Africa, and Marcel Jenni, Zurich. (*Ed Note:* Also present was Sigfried Breuning from the University of Alberta.)

George Webb's paper on the signing of freeways was discussed. Some of the members believed George had overdone the signs, but the chairman of the meeting pointed out the difference between California freeways and those in Europe.

Bruce Murray and I held a little meeting one noon and told those who were interested about the Institute and also the magazine "Traffic Engineering." I believe that we could sell a few subscriptions if we had some sample copies and order blanks at the next meeting.

JAMES K. GIBSON

Helpful TE Publication Available from U. S. Chamber of Commerce

If you are looking for a publication to help you sell a traffic engineering program to your city officials and businessmen, you will be interested in "How to Get the Most Out of Our Streets," published by the Chamber of Commerce of the United States and prepared by the Automotive Safety Foundation.

The booklet explains in easily understood language simple, inexpensive methods for making the best use out of existing streets, such as: How to modernize the traffic signal system; how to use one-way streets; how to eliminate confusion at complicated intersections; how to improve traffic flow; how to facilitate transit operation; how to create an effective community traffic program; and how to solve nearly every conceivable traffic problem.

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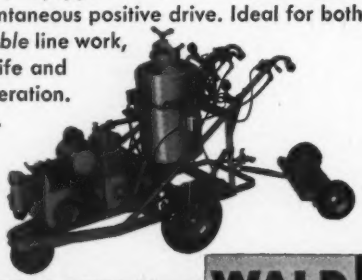

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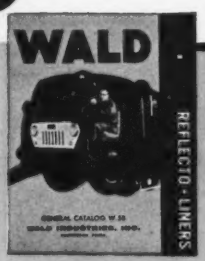

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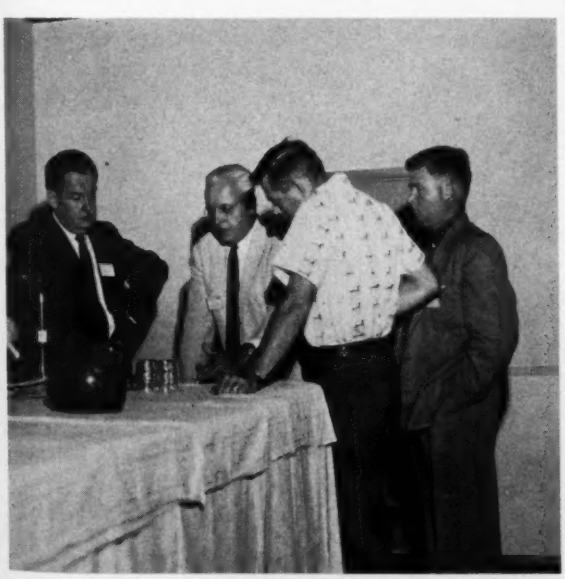
FREEWAY SEMINAR PHOTOS

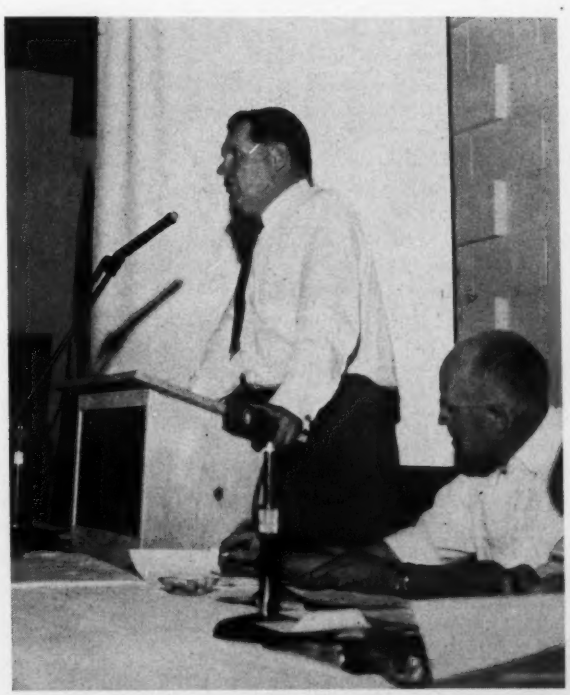
President Havenner, Commissioner Caldwell (Calif. Highway Patrol), B. W. Marsh, E. R. Ricker, and Wm. H. Polkinghorn (Director of Traffic for the Detroit Police Dept.) form a panel at Sacramento.

Part of the group in attendance at Sacramento. Note-taking has been very general at all seminars.



Not all the answers come in the formal sessions. Chief Sullivan and O. K. Normann answer questions during a "coffee break" at Sacramento.

D. W. Loutzenheiser, Chief of the Highway Design Division, U.S. Bureau of Public Roads, has been a participant in each of the four seminars held to date.



Police officers have had an important part in each seminar. Here Deputy Chief Harold W. Sullivan of Los Angeles talks at Sacramento.

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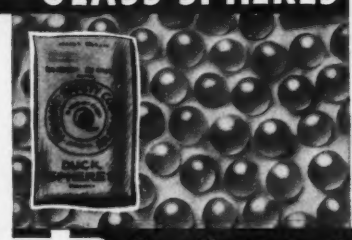

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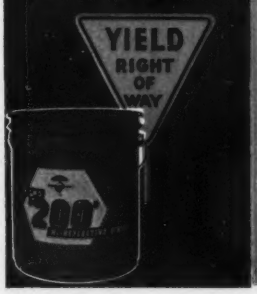

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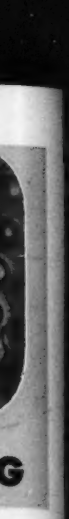
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